

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.

FOR the sake of his name Count Zeppelin has died three years too late. Had he shuffled off this mortal coil a few months before the war, we should have written him down as a scientist of no mean accomplishments, and as a man who in the steady pursuit of an ideal under circumstances of the bitterest disappointment has had few equals. To give him his due, we must still record that this is sufficiently descriptive of his life's work, and, enemy though he was, we can still find it in our hearts to pay a tribute of admiration to those qualities of perseverance and the spirit that admits no defeat, which at last brought Count Zeppelin to a triumphant conclusion of the labours of many years, pursued in the face of persistent ill-luck and almost of ignominy brought about by continued failure to achieve the apparently impossible. But for the war he might have gone down to history as one of the world's famous men. Now he will only be remembered as one of the arch-priests of frightfulness, who prostituted his undoubtedly great gifts in the pursuit of indiscriminate murder.

We have never been given to the form of hysteria which has led to the coining of phrases which the

more "yellow" Press has evolved for the description of air-raiders, and we are thus not going to perpetrate the solecism of writing of Zeppelin as the "chief of the baby-killers." But we can never forget—as we can never forgive—his callous justification of raids on open towns, involving the murder of women and children. "It is entirely rational," he said, "to regard a city or town that is occupied by military forces, which fire upon airships, or that has mounted guns for such purpose, as subject to aerial attack, just the same as if the attacking force were infantry or artillery."

It is not necessary to go beyond this quotation in search of an indication of the mentality of this arch-Hun. The whole psychology of the man is summed up in it. That it shows him to be neither better nor worse than his Imperial master, or those who serve him, is beside the point. His most fitting epitaph must be: "He was a Hun."

Scrap the Useless and Obsolete!

Mr. Pemberton Billing asked the Under-Secretary for War in the House last week if "it was still the custom to accept delivery of obsolete machines, and, although insisting upon the acceptance tests taking place, to remove the engines and burn the aeroplanes after such acceptance?" Major Baird, in his reply, said that it had never been the practice to burn aeroplanes immediately after acceptance when they have become obsolete. It might, he said, become necessary owing to shortage of storage accommodation to take this course before long in respect of certain machines. All contracts for machines which may have become obsolete or have turned out to be unfit for active service or for instructional purposes are cancelled as soon as this can be done without injustice to the manufacturers.

The sting of this, like that of the scorpion, is in the tail. Does the Air Ministry mean that at this late stage of the war it continues to countenance the building and delivery of machines that have become obsolete? Obviously, if the answer means anything at all it means that. We trust most sincerely that the matter will not be allowed to remain where it is, and that some member interested in aeronautics will insist upon a full explanation being given of exactly what course is pursued with regard to out-of-date machines. We are fully appreciative of the necessity for dealing out justice to the manufacturer, but this should at least go hand in hand with a due regard for efficiency. It would be far and away better, when a certain type, of which there might be as many as a

thousand on order, has been condemned as obsolete, to stop their building at once and pay the manufacturers for the lot, or adequate compensation, rather than that time and invaluable resources should be wasted in the manner in which it is practically admitted they are wasted. Every obsolete aircraft turned out to avoid "injustice to the manufacturers" takes the place of a more modern machine, to the manifest end that it inflicts injustice on the gallant men who have to fly in the face of the enemy. If it were only a question of "justice," then we should unhesitatingly say let that justice be done to the men in the field. But that need not enter into the argument at all. The point seems to be that it is all a question of money, and that the Government does not like to part with the latter unless it actually has something to show for it, no matter whether that something is of use or not. We are wasting enough money in the conduct of the war, and in a supremely vital matter such as this, surely the extra few hundred thousand pounds that would make the difference between efficiency and inefficiency do not greatly matter? Parliament must insist that as soon as a type has been decided to be obsolete its manufacture must be ceased forthwith, even if the whole undelivered series has to be paid for. That is a mere bagatelle under the circumstances. What matters is our mastery of the air, which is being put in jeopardy by such methods as are disclosed in the answer we have taken as our text.

**The Mastery
of the
Air.**

There was a disquieting caution in the manner in which Mr. Macpherson answered the questions put to him by Sir Henry Dalziel regarding the mastery of the air on the British front. Asked if he could assure the House that we still maintained that mastery, he replied: "I think I can give that assurance."

For our own part, we should like something a little more definite than this. Mr. Macpherson must know—the House of Commons knows, or it would not have greeted his answer with "Oh's"—that there are many reports current that, to put it mildly, things are not as well as they were six months ago. If they are not, and the Government is doing everything in its power to redress the balance, it will not depress the nation to be told as much. There is no question involved of giving information to the enemy—he knows as much about the position as our own command. If, on the other hand, we do in fact retain the full mastery of the air, why not tell us so in plain, unequivocal terms? We do not like the "hedging" manner of answering questions so beloved of the Ministerial mind. There is so much of the suggestion of suppressed facts about it that it inevitably defeats its own ends and leads to the multiplication of pernicious rumour. The answer under discussion is a case in point. A Minister gives a half-hearted reply to a question involving a matter of the most serious importance. It is manifest from the manner of its reception that his answer does not carry conviction to the House, and at once the man in the street jumps to the conclusion that we are hopelessly outmatched by the enemy's air forces. We who are to some extent on the inside of things know something of the true position, and are thus not misled by these half answers, but they do undoubtedly produce an evil effect on the minds of the public, and to that extent they are very much to be deprecated and deplored. Surely by this time the Government ought to know

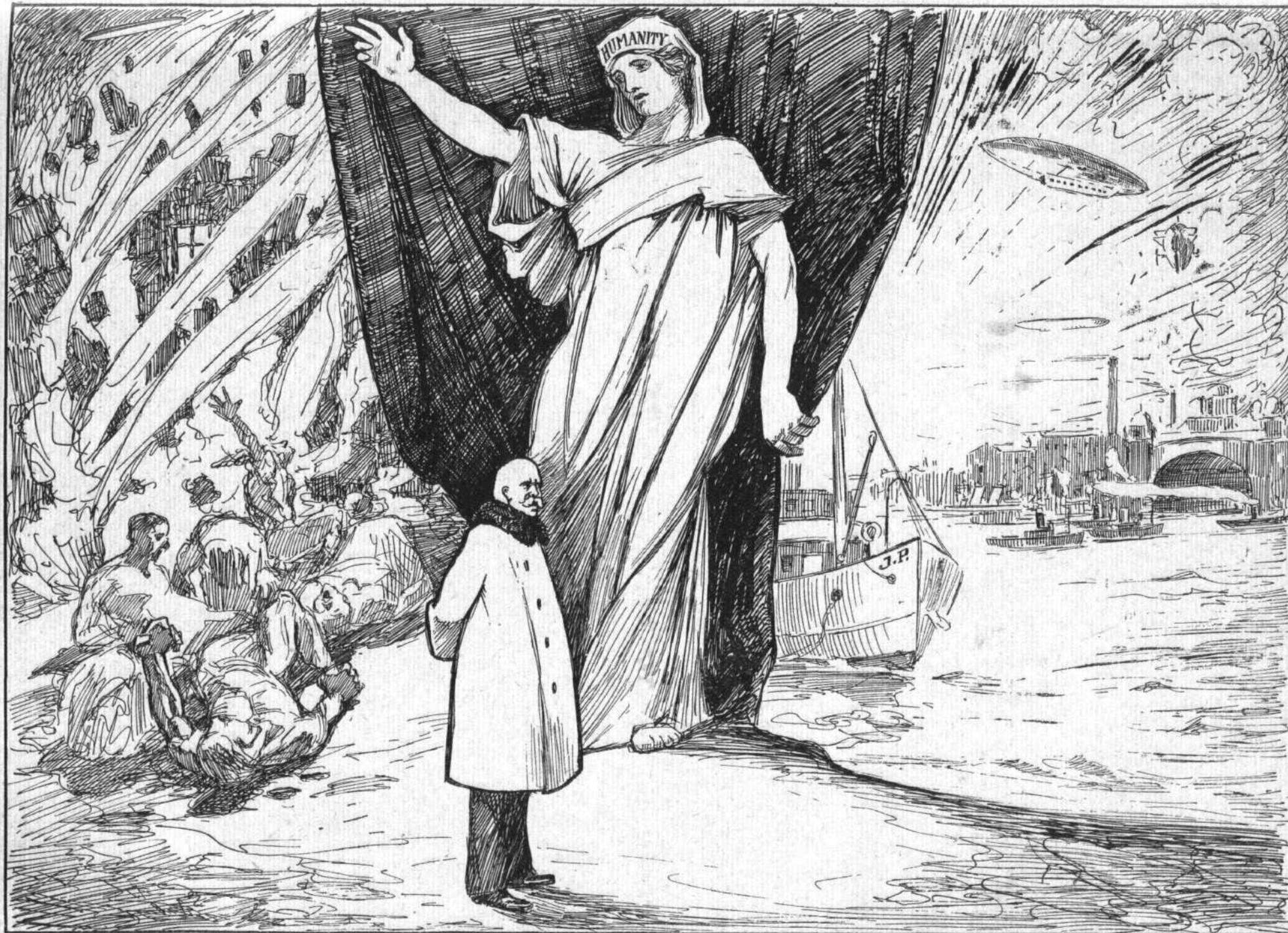
that the nation is not afraid of the truth. As we had occasion to remark some weeks ago, in quite another connection, more truth and less "control" would be better for everybody.

**The
Dardanelles
Report.**

While it is true that the Report of the Dardanelles Commission has no direct bearing on aircraft policy, it is nevertheless possible to obtain from its conclusions certain lessons which are not without their value in this connection. The first of these is in relation to the almost complete want of co-ordination between the fighting services displayed at the inception of this ghastly episode in our history. It is an aspect of the war to which we have never ceased to draw attention. Right from the very start of the war we have seen how this want of co-ordinate plan has wrecked hope after hope and brought to nothing plans brilliantly conceived and thoroughly sound in their fundamentals. It is this from which our air services have suffered, with the results that have, unfortunately, fallen to be discussed in these columns time after time. We are emerging from that state now, but untold harm has been done in the meantime. In other departments of our public life there is still visible a great deal of that want of co-ordination that spells efficiency, and until we get rid of it the affairs of the nation cannot be run on anything approaching business lines.

Another, and by far the most deplorable, aspect disclosed by the Report is the astounding levity with which our so-called statesmen rush into capital enterprises without thought or preparation. What are we to think of the politicians—call them statesmen we cannot—who committed the Empire to the forlorn hope of the Gallipoli campaign without even taking the trouble to ascertain the views of their expert advisers? What, again, are we to think of those same experts who sat, grim and silent, while the very fate of the British Empire was being staked in a gamble in which they knew the odds were against us, because, Heaven help them, they were not asked for their opinions? And these politicians still sit in the House of Parliament and take their share in the affairs of State. And these "experts" still walk with their heads erect as though they had deserved well of their country. And all, or most, of them continue to draw good money from the State in the form of salaries or pensions. As a famous Irish judge once remarked: "Truly, the English are a long-suffering people." We certainly have changed since our forefathers shot Admiral Byng, *pour encourager les autres*, else we should have demanded action prompt and drastic ere this. A more sorry, a more sordid page of history has never been written, and still we have been told only a part of the story. There are no words in the English language which are capable of expressing what the nation feels about this awful disclosure of political ineptitude and military incompetence. Well it is for those concerned that we are fully occupied with the more immediate business of rectifying the errors of the past and getting on with the war. The country has no time to spare for dealing with its unfaithful servants—yet.

As to the wisdom or otherwise of publishing the Report at the present juncture, we should like to know, before arriving at a final judgment, exactly why it has been made public now instead of waiting until the end of the war. On the face of it, it seems to be the height of unwisdom to lay bare to the eyes of the



Count Zeppelin, 1838-1917.

"One of the Greatest Sons of the Fatherland," and of "Immortal Fame"—for Frightfulness.

enemy all the sordid bungling and the sorry ineptitude which surrounded the most ghastly failure of the whole war. We imagine that the German General Staff will not grudge the sixpence it costs to obtain a copy of the Report from His Majesty's publishers. Certainly our own Government would be delighted to see a similar official record of incompetence and criminal levity issued by the enemy. It is being whispered abroad that there is more in the publication than meets the eye. Of that we are not in a position to say anything, but the real reasons will possibly emerge when the Report comes to be debated in Parliament. That it will be so debated almost goes without saying, for neither Parliament nor the nation is inclined to let the matter rest where it is. Then we may see the dictum falsified that the politician is never punished.

Are we Making a Business of War?

Under this title the *World* prints a long article, which in the main traverses the same ground as we have covered months ago in the columns of "FLIGHT." The writer, Mr. de Wend-Fenton, takes as his text the growth of bureaucracy, and speaks out with considerable freedom. In opening he says:—

"There seems to be a feeling among all classes of the community that it is highly dangerous to those principles of Liberty for which we are understood to be waging this war that we should indefinitely surrender ourselves, our souls and bodies, our present and future belongings, into the hands of a bureaucracy which bids fair to rival Prussian despotism without the saving grace of Prussian efficiency."

All of which we are in complete agreement with as the pages of "FLIGHT" testify. He proceeds to say:—

"We are taxed up to the very hilt, many of our securities are forcibly taken from us, and we are constantly urged to place all we have at the Government's disposal. At the same time, we are persistently hampered if we endeavour to replenish our exchequers by any form of enterprise in which the Government has not a finger, and consequently businesses are being closed all over the country. All this, on the assumption that it conduces to the successful prosecution of the war, we have borne without murmuring. But there is an uneasy feeling, a feeling which is growing and spreading, that the war is not the ultimate object of this outbreak of Bureaucracy which is spreading its tentacles far and wide until it is getting a grip on every department of our national life. The creation and multiplication of these new offices, each with its myriads of secretaries, clerks, and assistants, savours of a swarm of locusts which, like a plague of old, are settling down to devour once-Merrie England. Is it to be expected that all these new Departments, Boards and Committees, with their multitudinous off-shoots and ramifications, with their hordes of well-paid officials, will silently melt away with the signing of Peace? Does the man-eating tiger, once he has tasted human flesh, return to his previous uninteresting diet?"

"One might go a step further. Human nature is human nature. Is it absolutely certain that a Government to whom war has brought a degree of despotic power the mere suggestion of which three years ago would have been scouted as fantastic and impossible, will be in a desperate hurry to dam

the source of its greatness? Until the nation is completely broken in, may not Bureaucracy consider that the continuance of the war is not an unmixed evil? 'We shall not sheathe the sword,' said Mr. Asquith, 'until Prussian militarism has been broken.' 'We shall not sheathe the sword,' might be his successor's pledge, 'until British bureaucracy is secure.' Step by step we have been led on, by cajolery, by appeals, by fair promises, until we stand literally on the brink of slavery. For the first time since Cromwell's day Britain has put her head into a noose and handed the string to a Dictator. With lamb-like subservience we have accepted every edict under the well-worn formula that it was for the safety of the State."

Mr. de Wend-Fenton has made precisely the points that we have insisted upon time and again, and we welcome his advent to the field as a champion of our civil rights, which, as he and we have pointed out, are menaced right, left, and centre. To our way of thinking, the main seriousness of the position is that we are not getting the efficiency of the Prussian system, while we are suffering all its disabilities. After all, there is something to be said for a system that produces the best results, however irksome it may be to live under, but that is where the shoe pinches; we are *not* getting the best results or anything approaching them. That is why we view the future with the grave disquiet we do. Unless we are very careful, we shall find that bureaucracy in its most pernicious form is with us to stay. Then, indeed, will this England of ours not be worth living in or for.

"A Roll of Honour Problem."

We have received a number of letters in reference to our remarks last week on the subject of the scandal of the non-inclusion in the Roll of Honour of the names of officers killed on service in England. Notable in this correspondence is a letter from the mother of an officer killed while flying at home and who complains that not only does the name of the officer concerned not figure in the casualty lists, but in these cases the relatives do not receive the Royal telegram of condolence which is always sent when an officer is killed at the front. As our correspondent says, duty flights, even in England, are not joy-rides, and to our way of thinking it is scandalously hard that the poor consolation which is extended to the relatives of officers killed on active service should be withheld simply because an officer meets his death on duty in England. It seems to us to be one of those matters which ought to be taken up by some member of Parliament who has weight enough to secure some alteration in the absurd regulation which works thus hardly on the kith and kin of officers who give their lives for King and Country equally as much as though they died in the face of the enemy. We know enough of the methods of the bureaucrats of the War Office to be certain that *they* are not likely to move except under the pressure of opinion from outside.

The Death of Count Zeppelin.

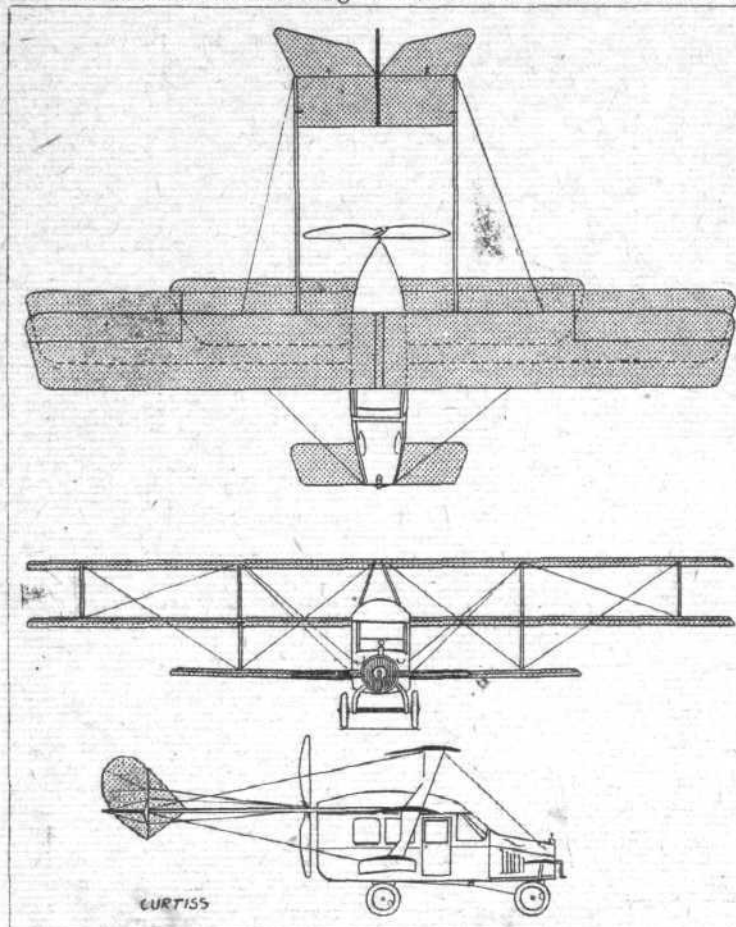
By the death of Count Zeppelin at Berlin on March 8th Germany has lost one of her most popular idols, while aeronautics has lost probably her most enthusiastic and persistent worker, albeit his inventions have been turned to such dastardly purposes. Born at Constance on July 8th, 1838, Count Ferdinand von Zeppelin was nearing the end of his seventy-eighth year. He was a veteran of the American Civil War, when he fought for the Union, and he had taken part in the Austro-Prussian war of 1866 and the Franco-German war of 1870. He retired from the army in 1891 with the rank of General of Cavalry, and then began to devote himself seriously to the study of airships. His first vessel, which was 420 ft. long and carried two 16 h.p. motors, was

tried in 1900, and then followed a series of alternate successes and disasters. It is unnecessary, however, to refer in detail to the history of the Zeppelin airship, as it was given in our issue of October 26th, together with sketches showing how the design was gradually developed. The immediate cause of Count Zeppelin's death was inflammation of the lungs supervening after an intestinal operation. The funeral took place at Prag Cemetery, Stuttgart, on March 12th. The King of Wurtemberg offered a tomb in the Royal cemetery. By the Kaiser's command General von Hoeppner, Commander-in-Chief of the German Air Services, attended the funeral, and a large number of workers from the Zeppelin works at Friedrichshafen were present. Two airships, flying black flags, cruised over the town and dropped wreaths to the ground, and ten aeroplanes appeared over the cemetery.

AT THE AMERICAN AERO SHOW—SOME NEW TYPES.

The Curtiss Autoplane.

This machine, one of the greatest attractions of the exhibition, constitutes a modern designer's idea of the "limousine of the



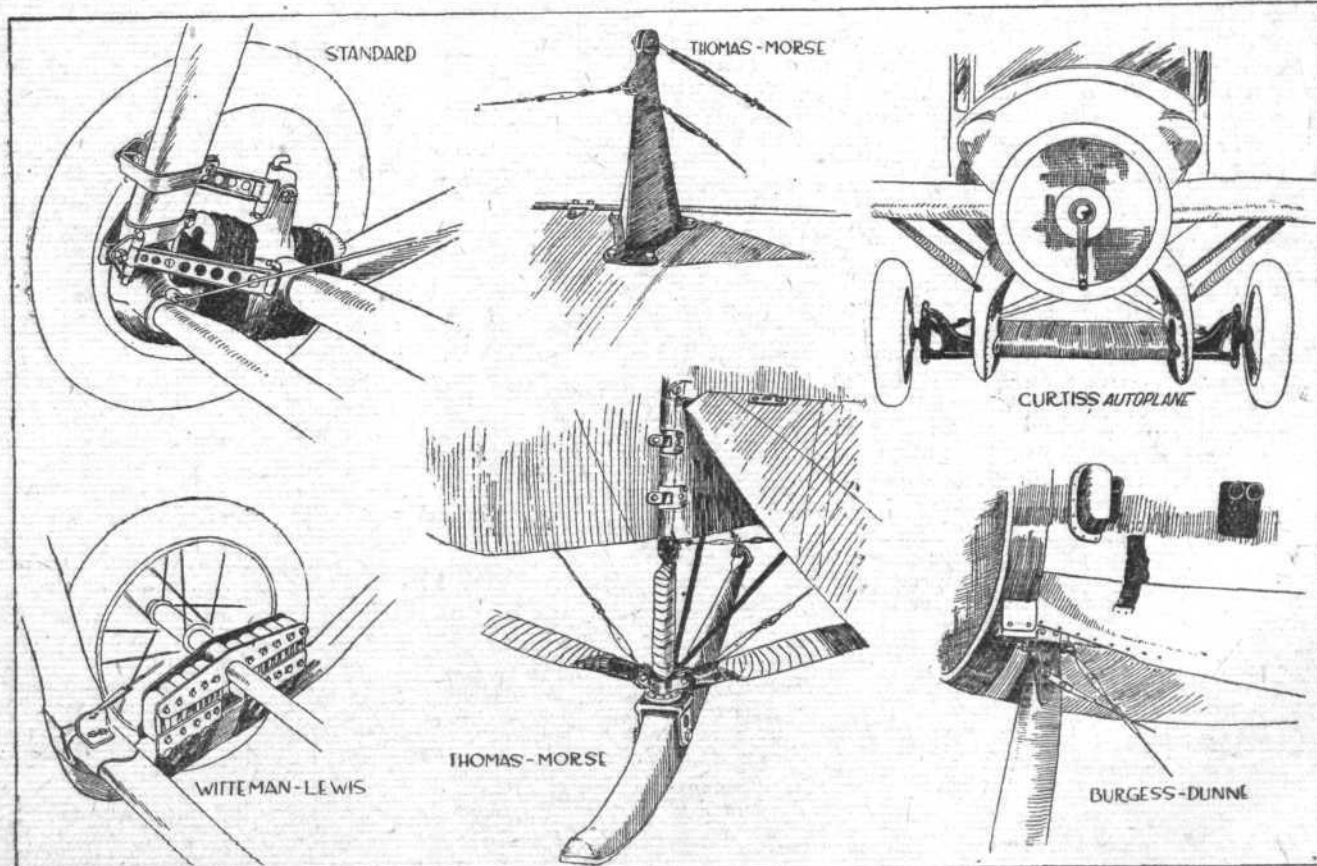
CURTISS

air." The body is a combination of motor car and aeroplane practice, and follows very closely the lines of a modern

limousine or coupé car-body. It is constructed mainly of aluminium, the windows being of celluloid. Elaborate upholstery and tapestries are employed for the interior, which accommodates two passengers at the rear and a "chauffeur" forward. Right in front is a circular radiator, through which passes a starting handle for the engine, a Curtiss OXX 100 h.p., which is located under the bonnet. From the engine, power is transmitted through a shaft, extending to the rear of the body, to the four-bladed propeller located at the top. There is a pair of wheels fore and aft, mounted in a similar way as on the Curtiss tractor triplane. The axle of the front pair, however, follows motor car practice, in that the wheels are pivoted and connected to the control so as to enable the machine to be steered on the ground. The triplane wings are also similar to the triplane tractor, except that they are staggered and the lower plane is of shorter span. The wing section is "F-2" with an angle of incidence of 4° and a dihedral angle of 3° to the lower plane. The top plane is attached to a *cabane* mounted on the roof of the "car," whilst the centre and lower planes are attached to the body itself. Covered-in K-shape interplane struts separate the planes, and interconnected *ailerons* are fitted to top and centre planes. The tail is carried by a pair of horizontal tubular outriggers attached to the centre plane. The tail surfaces consist of a rectangular horizontal stabiliser, divided elevators, rudder and triangular vertical fin. Mounted on the bonnet, just above the front wheels, is a small plane. The general dimensions are as follows:—Span (top and centre) 40 ft. 6 ins., (bottom) 23 ft. 4 ins.; chord (top and centre) 4 ft., (bottom) 3 ft. 6 ins.; gap, 3 ft. 3 ins.; stagger, 11 ins.; overall length, 27 ft.; height, 10 ft.; width of body, 3 ft. 6 ins.; speed range, 45-65 m.p.h.; useful load, 710 lbs.

The Cooper Training Biplane.

In general design this machine, built by the John D. Cooper Aeroplane Corp., of Bridgeport, Conn., mainly for training purposes, resembles the Caudron tractor biplane. The wings and tail planes have flexible ribs as on the latter machine. The single seater *nacelle* is also similar. As shown in the accompanying illustration, the machine is equipped with two floats, mounted on the skids, but for land use these can be substituted by Farman-type wheels. These floats measure 9 ft. long, 1 ft. 10 ins. beam, and 9 ins. deep, and each weigh 46 lbs. Two tail floats are also fitted. A 5-cyl. two-cycle

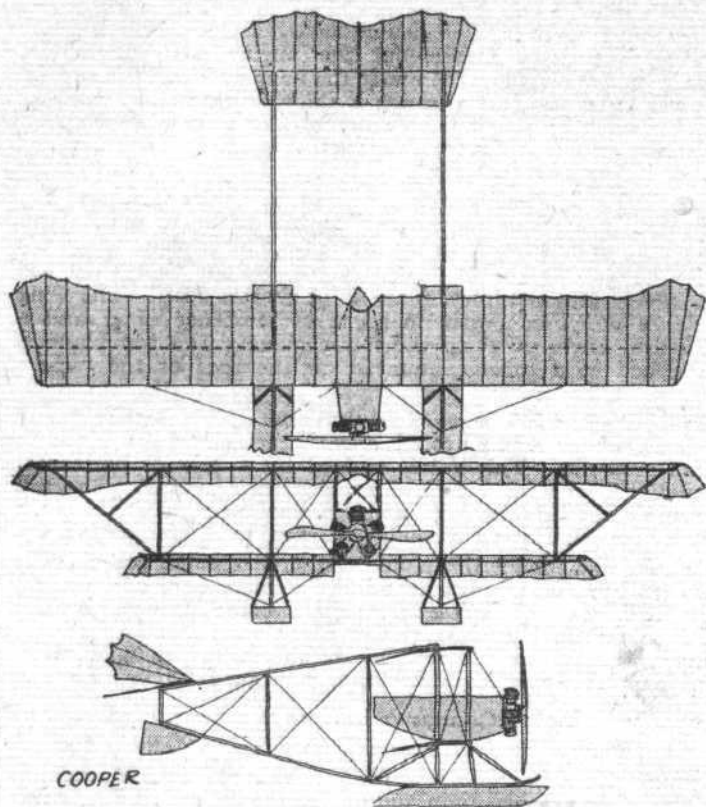


AT THE AMERICAN AERO SHOW.—Some constructional details. From left to right, top row: The shock-absorbing device on the chassis of the Standard tractor; control-surface crank-lever on the Thomas tractor; the front steerable wheels on the Curtiss "Autoplane." Bottom row: The Witteman-Lewis bridge-type shock-absorber; tail-skid on the Thomas tractor; the rear strut attachment to the *nacelle* of the Burgess-Dunne seaplane.

The "Automobile," N.Y.

Frederickson rotary engine (70 h.p.) is employed, mounted on a steel plate at the nose of the *nacelle*. All control wires are solid, except when they run over the ball-bearing pulleys,

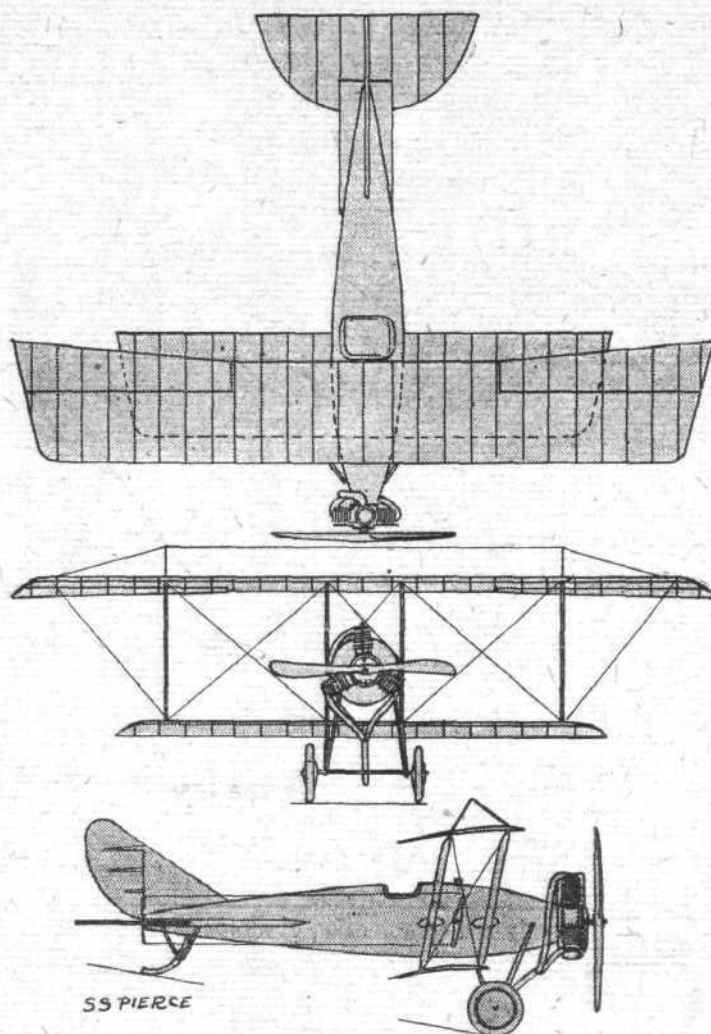
from the engine is led through nicked pipes below the lower plane. General dimensions:—Span (top) 26 ft., (bottom) 20 ft.; chord, 4 ft.; gap, 5 ft. 6 ins.; supporting surface 182 sq. ft.; overall length, 20 ft.; weight (empty), 630 lbs.; speed range, 35-50 m.p.h.; climbing speed, 300 ft./min.



when cable is employed. General dimensions:—Span (top) 33 ft., (bottom) 22 ft.; chord, 4 ft. 6 ins.; gap, 4 ft. 4 ins.; weight (empty), 500 lbs.

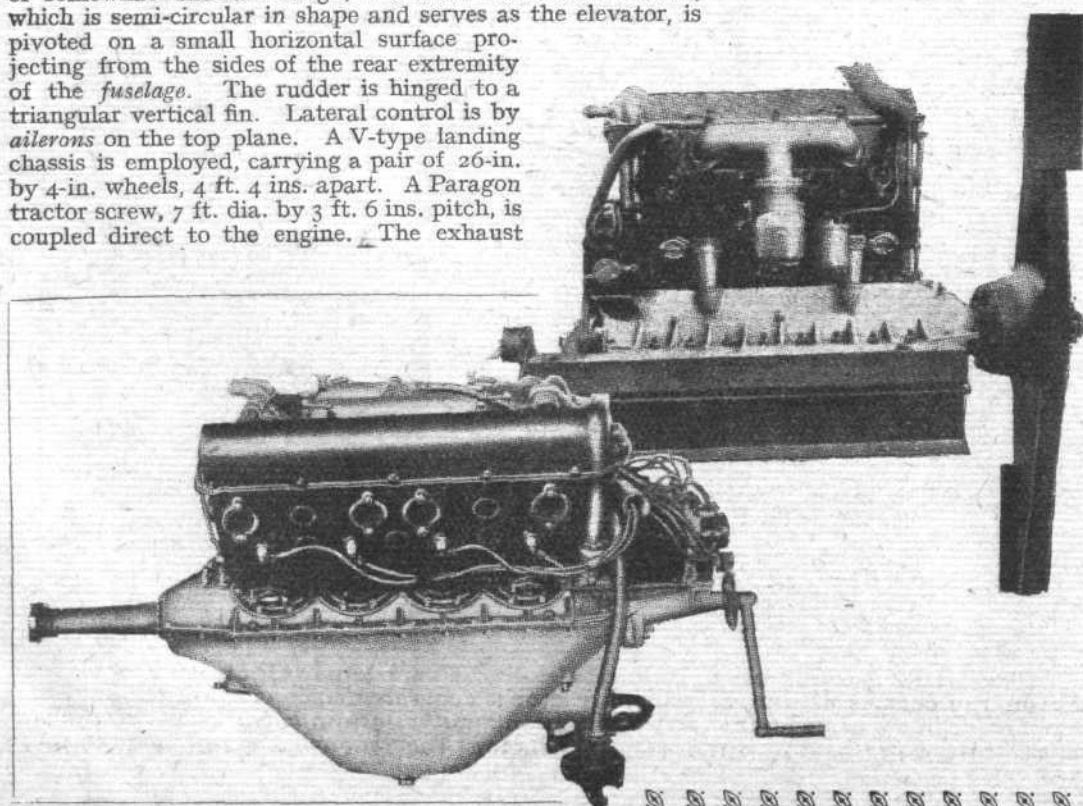
The S. S. Pierce Sporting Tractor.

This is a small, single-seater tractor biplane, lightly but strongly built, specially to meet the requirements of the sportsman. The *fuselage* is of streamline form, circular in section, mounted 6 ins. above the lower plane on the central interplane struts. The engine, designed specially for the machine by the S. S. Pierce Aero Corp., is a 3-cyl. Y-type, air-cooled, of 35-40 h.p. The planes are staggered 1 ft. and are set at 4° incidence. There are only four pairs of interplane struts, two central pairs to which the *fuselage* is attached, and one pair on each side of the latter. The tail planes are of somewhat unusual design, the main horizontal surface, which is semi-circular in shape and serves as the elevator, is pivoted on a small horizontal surface projecting from the sides of the rear extremity of the *fuselage*. The rudder is hinged to a triangular vertical fin. Lateral control is by *ailerons* on the top plane. A V-type landing chassis is employed, carrying a pair of 26-in. by 4-in. wheels, 4 ft. 4 ins. apart. A Paragon tractor screw, 7 ft. dia. by 3 ft. 6 ins. pitch, is coupled direct to the engine. The exhaust



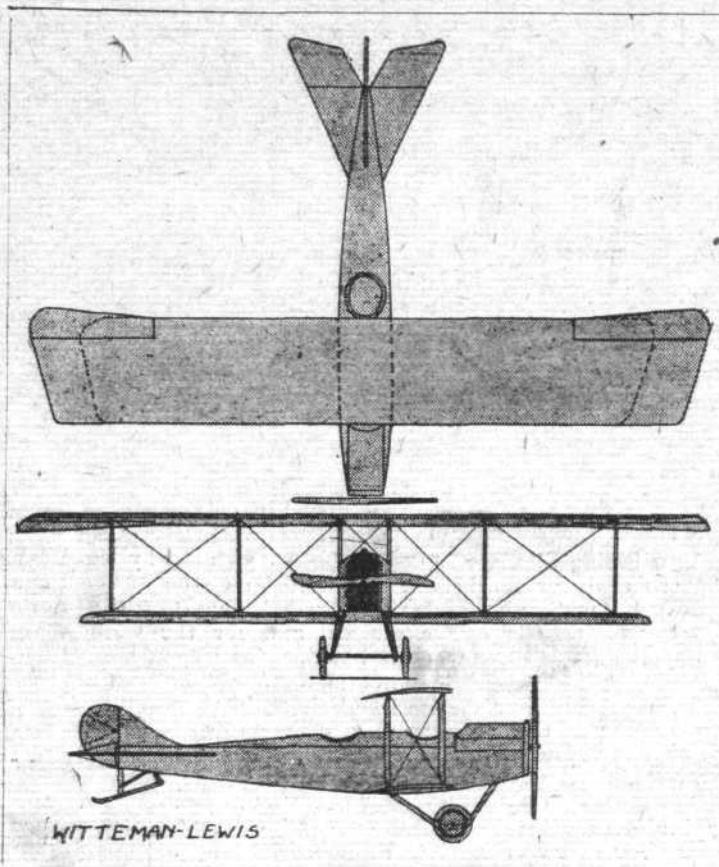
The Wittman-Lewis Training Tractor.

In general appearance the Wittman-Lewis machine follows the conventional military tractor-type biplane, special attention having been paid to strength rather than original design. It has a rectangular section *fuselage*, tapering to a vertical knife-edge at the rear, and a turtle-deck top. Pilot's



At the American Aero Show.—Two Hispano-Suiza aero engines, which engine is now being manufactured in America by one of the subsidiary companies of the Wright-Martin Aircraft Corp. In the top right-hand corner is the 4-cyl. vertical 75 h.p. model, and below, the 8-cyl. V 150 h.p.

By courtesy of the "Automobile," New York.



and passenger's cock-pits are in tandem, the former one being situated back of the planes. A 70 h.p. Hall-Scott A-7 engine is mounted in the nose, with the radiator in front, and fuel capacity is provided for a flight of three hours' duration. A V-type chassis is employed, with bridge-type shock absorbers. Dep. dual control is fitted. General dimensions:—Span (top) 42 ft., (bottom) 34 ft.; chord, 5 ft. 6 ins.; gap, 5 ft. 10 ins.; overall length, 27 ft.; net weight, 1,400 lbs.; speed range, 35-70 m.p.h. The triangular tail surface has an area of 36 sq. ft.

An Aircraft "At Home."

THE event of the aeronautic season promises to be the "At Home" which is being held by the Royal Aero Club, the Aeronautical Society and the Society of British Aircraft Constructors, at the Countess of Drogheda's aircraft exhibition at the Grosvenor Galleries, 51A, New Bond Street, W. The function takes place to-night, Thursday, March 15th, and the guests will be received at 8.30 p.m. by the Countess of Drogheda, Major-General Ruck, Prof. Huntington and Mr. White-Smith, the respective chairmen of the three societies who are bearing all the expenses, so that the gross proceeds will go to the Flying Services Fund.

The exhibits on view in the Galleries will be very largely increased for the occasion, and short descriptive lectures will be given by General Brancker, Colonel O'Gorman, Mr. B. G. Cooper and others. A special feature will be the films shown by Mr. Handley Page of large and small aeroplanes in flight, which aroused such great interest at Mr. Handley Page's recent lecture before the Aeronautical Society.

Tickets, costing 2s. 6d. to members of the above societies and 5s. to visitors, can be obtained at the Grosvenor Galleries.

THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

Killed.

Midshipman E. R. Snow, R.N.

Died of Wounds.

Flight Sub-Lieut. L. A. Powell, R.N.

Missing.

Flight Sub-Lieut. J. J. de la T. Fox, R.N.

Lieut. H. G. Southon, R.N.V.R. (R.N.D., attd. R.F.C.).

Flight-Lieut. H. R. Wambolt, R.N.

Flight Sub-Lieut. J. P. White, R.N.

Accidentally Injured.

Prob. Flight Officer L. E. Allen, R.N.

Previously reported Missing, now reported a Prisoner of War.

Flight Sub-Lieut. G. T. Bysshe, R.N.

Previously reported as believed to be Prisoners, now Officially reported Prisoners of War.

Sub-Lieut. W. C. Jameson, R.N.V.R.

Flight-Lieut. C. A. Maitland-Heriot, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. V. M. Bowling, R.F.C.

2nd Lieut. W. Harms, Northumberland F., attd. R.F.C.

2nd Lieut. B. W. Hill, F.R.C.

2nd Lieut. E. E. Horn, Middlesex, attd. R.F.C.

2nd Lieut. H. A. Johnson, R.F.C.

Capt. J. McArthur, R.F.C.

2nd Lieut. H. F. MacKain, R.F.C.

2nd Lieut. E. A. Pope, R.F.C.

Lieut. G. Vaughan-Jones, R.E. and R.F.C.

Accidentally Killed.

2nd Lieut. E. V. Bayley, S. Staffs. and R.F.C.

Previously reported Missing, believed Killed, now reported Killed.

2nd Lieut. J. L. Pulleyn, Dorset, attd. R.F.C.

Died of Wounds.

2nd Lieut. B. A. Morgan, R.F.A., attd. R.F.C.

2nd Lieut. W. W. Steuart, Highland L.I., attd. R.F.C.

Died.

47876 2nd Air-Mech. J. E. Heyworth, R.F.C.

993 Corpl. A. Moody, R.F.C.

50027 2nd Air-Mech. H. Young, R.F.C.

Wounded.

Capt. E. Fletcher, A.S.C. and R.F.C.

2nd Lieut. D. R. C. Gabell, Gloucester, attd. R.F.C.

2nd Lieut. W. A. Golding, R.F.C.

2nd Lieut. E. McM. Howes, R.F.C.

Lieut. H. Lambourne, R.F.C.

Lieut. H. G. Nickalls, Yeo. and R.F.C.

2nd Lieut. F. H. E. Reeve, Northumberland F. and R.F.C.

Lieut. R. W. Scoles, R.F.C.

2nd Lieut. A. R. M. Scrase-Dickins, King's R.R.C. and R.F.C.

Lieut. G. K. Simpson, R.F.C.

3232 1st Air-Mech. H. L. Cottingham, R.F.C.

Missing.

2nd Lieut. C. S. Cravos, R.F.C.

2nd Lieut. A. H. Fenton, R.F.C.

2nd Lieut. H. J. Green, R.F.C.

Capt. A. Lees, R. West Kent, attd. R.F.C.

2nd Lieut. A. W. Reid, K.O. Scot. Bord., attd. R.F.C.

2nd Lieut. P. L. Wood, R.F.C.

Missing, believed Prisoner of War in Turkish hands.

Lieut. A. J. Lazarus-Barlow, Yeo. and R.F.C.

Previously reported Missing, now reported Prisoner of War in German hands.

2nd Lieut. M. E. Woods, R.F.C.

Correction 1

Wounded.

2nd Lieut. W. J. Pearson, R.A.M.C., attd. R.F.C., should read 2nd Lieut. W. J. Pearson, R.F.C.

Poisoned Sweets from German Aeroplanes.

THE Amiens correspondent of the *Petit Journal* reports that the Prefecture of the Somme has issued a warning to the people of Amiens against sweets dropped from German aeroplanes into the British lines. It is stated that bacteriological examinations have shown that sweets dropped from Austrian aeroplanes contained virulent cultures of cholera,

plague, dysentery, &c.

The civil population are asked to take any sweets that may be found on the ground [after enemy raids to the police or to the bacteriological laboratory, where they will be submitted to an examination. Parents should particularly warn their children not to pick up any sweet from the ground.

ROYAL AERO CLUB OF THE U.K. OFFICIAL NOTICES TO MEMBERS.

ANNUAL GENERAL MEETING.

THE Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Tuesday, March 20th, 1917, at 6 o'clock, at 3, Clifford Street, London, W.

AGENDA.

1. To elect Vice-President and Council for the ensuing year.
2. To announce result of Ballot for Committee.

COMMITTEE.

The following members have been nominated for the Committee:—

Brig.-Gen. W. S. Brancker, R.F.A.
Griffith Brewer.
Ernest C. Bucknall.
Capt. R. L. Charteris, R.F.C.
L. Coatalen.
Commander Sir Arthur Trevor Dawson, R.N.
Flight-Commander John Dunville, R.N.
Wing-Commander D. A. Spenser Grey, R.N., D.S.O., D.S.C.
Col. Sir Capel Holden, K.C.B., F.R.S.
Prof. A. K. Huntington.
Wing-Commander A. M. Longmore, R.N.
Squadron-Commander F. K. McClean, R.N.
Col. E. M. Maitland.
Lieut. N. C. Neill, R.N.V.R.
Lord Northcliffe.
Wing-Commander Alec Ogilvie, R.N.
Lieut.-Col. Mervyn O'Gorman, C.B.
Lieut.-Col. P. H. L. Playfair.
Flight-Commander C. F. Pollock, R.N.
J. H. Spottiswoode.
G. Holt Thomas.

A ballot paper for the election of nine candidates to the Committee of the Club has been issued to the Members.

Aircraft Exhibition, Grosvenor Galleries,
51a, New Bond Street, W.

The Aeronautical Society of Great Britain, the Society of British Aircraft Constructors and the Royal Aero Club will be "At Home" at Lady Drogheda's Aircraft Exhibition at the Grosvenor Galleries, 51A, New Bond Street, W., on Thursday, March 15th, 1917, at 8.30 p.m.

Short addresses on aeronautics will be given by Brig.-Gen. W. S. Brancker, Lieut.-Col. Mervyn O'Gorman, C.B., and others. Cinematograph films will also be shown.

Price of Tickets: Members 2s. 6d., Visitors 5s.

The entire proceeds will be devoted to Lady Henderson's Royal Flying Corps Fund and the Flying Services Fund.

Tickets can be obtained from the Secretary, Royal Aero Club, 3, Clifford Street, W.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

Subscriptions.

	£	s.	d.
Total subscriptions received to Feb. 27th, 1917	11,197	7	3
Collected at the Trocadero Restaurant (Second contribution)	0	7	0
Staff and Workers of Gwynnes, Ltd. (Thirty-fourth contribution)	9	2	
Employés of Ruston, Proctor, and Company Aircraft Works (Sixteenth contribution) ..	3	0	0

Total, March 13th, 1917 11,209 16 4

B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W.

HONOURS.

Honours for the R.F.C.

In the list of decorations and honours announced on March 9th as having been awarded at various dates by the Allied Powers for distinguished services rendered during the campaign, the following appear:—

Conferred by the President of the French Republic.

CROIX DE GUERRE.

2nd Lieut. H. M. C. LEDGER, T.A. Res., attd. French Seaplane Squadron, October 28th, 1915.
208 Sergt.-Major A. HUNTER, R.F.C. (now 2nd Lieut., W. Riding R., attd. R.F.C.), February 8th, 1917.

Conferred by the King of Montenegro, Oct. 31st, 1916.

SILVER MEDAL FOR BRAVERY.

2nd Lt. (Tp. Capt.) J. O. ANDREWS, M.C., R. Scots and R.F.C.
2nd Lieut. A. L. GORDON-KIDD, R.F.C.

Conferred by the Sultan of Egypt, Nov. 20th, 1916.

ORDER OF THE NILE, 4TH CLASS.

Capt. S. GRANT-DULTON, D.S.O., Yorks and R.F.C.
Major A. J. ROSS, D.S.O., R.E., and R.F.C.
Temp. Capt. H. A. VAN RYNEVELD, M.C., R.F.C.

It was announced in a supplement to the *London Gazette* issued on March 12th that the King has been pleased to approve of the appointment of the following officer to be Companion of the Distinguished Service Order in recognition of his gallantry and devotion to duty in the Field:—

Lt. (Temp. Capt.) SELDEN HERBERT LONG, M.C., Durh. L.I. and R.F.C.

For great skill and daring in piloting his machine. He shot down an enemy machine, which fell in our lines, and the same day he forced another hostile machine to land in the enemy's lines. Later he shot down another enemy machine, which fell in our lines.

The King has been graciously pleased to award a Bar to the Military Cross to the following officer:—

Tp. Lt. (Tp. Cpt.) W. G. S. CURPHEY, M.C., Gen. List and R.F.C.

He, with a patrol of four machines, attacked a hostile formation of ten machines. After a prolonged fight he drove one enemy machine down. Later, although wounded, he again led another attack on a hostile machine and succeeded in bringing it down. He has on many previous occasions done fine work. (M.C. was awarded in *Gazette* dated November 14th, 1916.)

The King has been graciously pleased to confer the Military

Cross on the following officers in recognition of their gallantry and devotion to duty in the field:—

2nd Lt. CECIL GORDON-DAVIS, N. Staff. R. and R.F.C.

For conspicuous gallantry and devotion to duty. He brought down a hostile machine. Later, during the same flight, he attacked four enemy machines, split up their formation, and brought one of them down. He set a splendid example of courage and determination in the face of superior forces.

Capt. ROBERT M. KNOWLES, Norf. R., Spec. Res., and R.F.C.

When acting as observer he showed throughout the greatest courage in the face of very superior forces, and a high standard of marksmanship.

2nd Lt. JAMES T. BYFORD MCCUDDEN, Gen. List and R.F.C.

He followed a hostile machine down to a height of 300 ft. and drove it to the ground. He has shown marked skill on many previous occasions, and has destroyed two hostile machines and driven another one down out of control.

The King has been pleased to award the Military Medal for bravery in the field to the following:—

8575 1st Air-Mech. A. BALFOUR, R.F.C.
15632 1st Air-Mech. W. E. PERKINS, R.F.C.
24981 Corpl. W. J. PERROTT, R.F.C.
1145 Flight-Sergt. F. N. SLINGSBY, R.F.C.
18030 2nd Air-Mech. H. T. TAYLOR, R.F.C.

The King has been pleased to award the Meritorious Service Medal to the following, in recognition of valuable services rendered with the Armies in the Field during the war:—

3450 Flight-Sergt. L. FRIER, R.F.C.
106 Flight-Sergt. G. J. LANGFIELD, R.F.C.
63 Flight-Sergt. A. E. LEWIS, R.F.C.
11181 Corpl. R. R. TURNER, R.F.C.
20943 1st Air-Mech. T. P. WATSON, R.F.C.

The King has been graciously pleased to award the Meritorious Service Medal to the following, for gallantry in the performance of military duty:—

18471 Corpl. G. DUNN, R.F.C.

"Mentioned in Despatches."

THE following should be added to the list of names, given in "FLIGHT" of March 1st, brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war:—

Capt. F. C. JENKINS, R.F.C.
929 Flight-Sergt. E. RUMSEY, R.F.C.

ANSWERS TO CORRESPONDENTS

[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—ED.]

S. G. P. (A.M., R.N.A.S.).

Generally speaking, it is not possible, or at any rate expedient, to calculate the resistance of struts from given figures of speed, fineness ratio and area, as the resistance may vary very considerably according to shape, even in a section of given area and fineness ratio. Mr. Handley Page, as long ago as 1912, devised a method of calculating the "sweep-factor" of a cambered plane, but, as a general rule, the resistance of struts is determined exclusively from wind tunnel tests. Mr. Alec Ogilvie had tested, at the National Physical Laboratory, a series of struts of varying shape and fineness ratio, and the results of the tests were published in the June 15th issue of "FLIGHT," 1912. A copy of this issue can be obtained from the offices of "FLIGHT," the price being 1s. 6d. In addition to these tests numerous others have been carried out at the National Physical Laboratory, the results of which are described in the reports of the Advisory Committee for Aeronautics.

C. N. H. B. (Tonbridge).

A useful aid to recognising machines in the air could only be provided by illustrations of the machines in question, and as we are not at present allowed to publish illustrations of various modern British aeroplanes, we regret that we are unable to furnish you with the information desired. From the vague description given in your letter it is impossible to state for certain what the machine you refer to may have been, but the probabilities are that it was, as you surmise, an R.E.

L. J. P. (R.N.A.S.).

The effect of placing vertical fins above the top plane of a biplane is to raise the centre of pressure of the side area or vertical area of the machine. The side area is composed of the rudder, fin, sides of body, chassis struts, wheels (if enclosed), interplane struts, dihedral angle (if any) and propeller. If it is found that the resultant centre of pressure of all these items comes below the centre of gravity a couple is set up which tends to aggravate a bank. By placing fins above the top plane this centre of pressure may be raised above the c.g., thus producing a righting couple in case of a side-slip. The same effect might be obtained by a larger dihedral angle, but this is not always desirable from other considerations, hence the fins on some machines. In flying boats the c.p. of the side area is frequently situated fairly low, on account of the large side area of the boat, and hence this type of craft is very often provided with vertical fins above or just below the top plane. The effect of these fins, in any machine, on the steering will depend on their position in a fore-and-aft sense. If they are situated ahead of the c.g. they tend to cause the machine to spin; if behind the c.g. the effect will, of course, be the reverse. As, however, they are usually placed between the two spars of the wings, they are practically on the c.p., and as this is never very far removed from the c.g., it follows that the fins will not usually be far from the c.g.; in other words, the effect of the fins on steering will not generally speaking be very great.

J. S. D. (Montrose).

There is practically no difference between a B.E.2c and a B.E.2d, except that the former has a skid chassis, whereas in the latter the under-carriage is of the "Vee" type. The engine fitted as standard in the pre-war Avro biplanes was a Gnome 80 h.p., but possibly others have been fitted on occasion, according to which make was available. The machine you refer to is, we believe, a B.E.2e.

J. R. B. (New Southgate).

In our article entitled "Units Employed in Recording the Results of Wind Tunnel Experiments," published in the January 25th issue of "FLIGHT," the numerical examples, after substituting in the formula $P = C_p v^2$, were $P = 0.3 \times 0.00238 \times 100^2 = 7.14$ lbs./sq. ft., and $P = 0.3 \times 0.0051 \times 68.4^2 = 7.14$ lbs./sq. ft., respectively, and not, as stated in your letter,

$$\frac{3}{0.00238 \times 100^2} = 7.14 \text{ lbs.}, \text{ and } \frac{3}{0.0051 \times 68.4^2} = 7.14 \text{ lbs.}$$

If you had read and checked the article in question carefully, you might have saved yourself and others much valuable time, and also discovered that in point of cold fact $0.3 \times 0.0051 \times 68.4^2$ is not equal to 7.14, but to 7.1581968. This difference, however, is of absolutely no practical importance, especially as the numerical example was only published in order to show the application of the formula $P = C_p v^2$.

E. C. F. (Lincoln).

You could hardly do better than study the "Design of Aeroplanes," which can be obtained from "FLIGHT" office for 9s. 6d. post free.

Mechanic (Wycombe).

Generally speaking an Equipment Officer is responsible for the equipment of his unit. Certainly a knowledge of mechanical engineering would be an advantage. Apply to the Directorate of Military Aeronautics, War Office, S.W.

P. W. S. (Glasgow).

There are no books in English dealing with the design and construction of dirigibles. There are one or two German books dealing with non-rigid and semi-rigid types.

H. W. H. (Ealing).

You should get very useful knowledge from "Aircraft of To-day," which costs 5s. 6d. post free from "FLIGHT" office; while another book which should help you would be "The Aeroplane Speaks," which now costs 7s. post free. You would be provided with your uniform, and your pay until granted your commission would be the same as an ordinary private.

W. H. M. (Coventry).

See reply to H. W. H. (Ealing). Apply to the Directorate of Military Aeronautics, War Office, S.W.

N. W. G. E. (Bristol).

It is impossible to say whether you would be accepted or not. If the doctor passed you there would be no difficulty probably. Your best plan would be to send in an application.

F. M. (Lichfield).

We have not heard that the Americans have selected a marking yet.

E. P. (Burton).

You should write to Major Mitchell, R.F.C., The Polytechnic, Regent Street, W., stating full particulars.

E. J. R. (Sunderland).

You will not be able to join the R.F.C. until you are 18 years old. In the meantime you had better continue at evening schools and study aviation as much as possible.

S. E. P. (Amhurst Park).

1. Yes. 2. You would probably have to pass a special medical examination. 3. No. 4. Your age and the fact that you are married would almost certainly bar you from being accepted.

H. L. G. (South Norwood).

We believe the folding plates you refer to are now out of print.

C. W. (Stone).

The pay is that of a private in the infantry. You will receive instructions as to uniform when you are appointed.

C. S. (London).

With care you should be able to live on the pay. You would find "Aircraft of To-day" and "The Aeroplane Speaks" both useful. The former costs 5s. 6d. and the latter 7s., post free, from "FLIGHT" office.

E. M. (Burgess Hill).

Apply to the Wireless Officer, R.N.A.S., Talbot Works, Barlby Road, W., or to Major Mitchell, R.F.C., The Polytechnic, Regent Street, W.

F. H. (Reigate).

You would hardly be qualified for a situation as draughtsman, but you might get a good position as a "tracer" if quick and accurate. Vacancies are occasionally advertised in "FLIGHT."

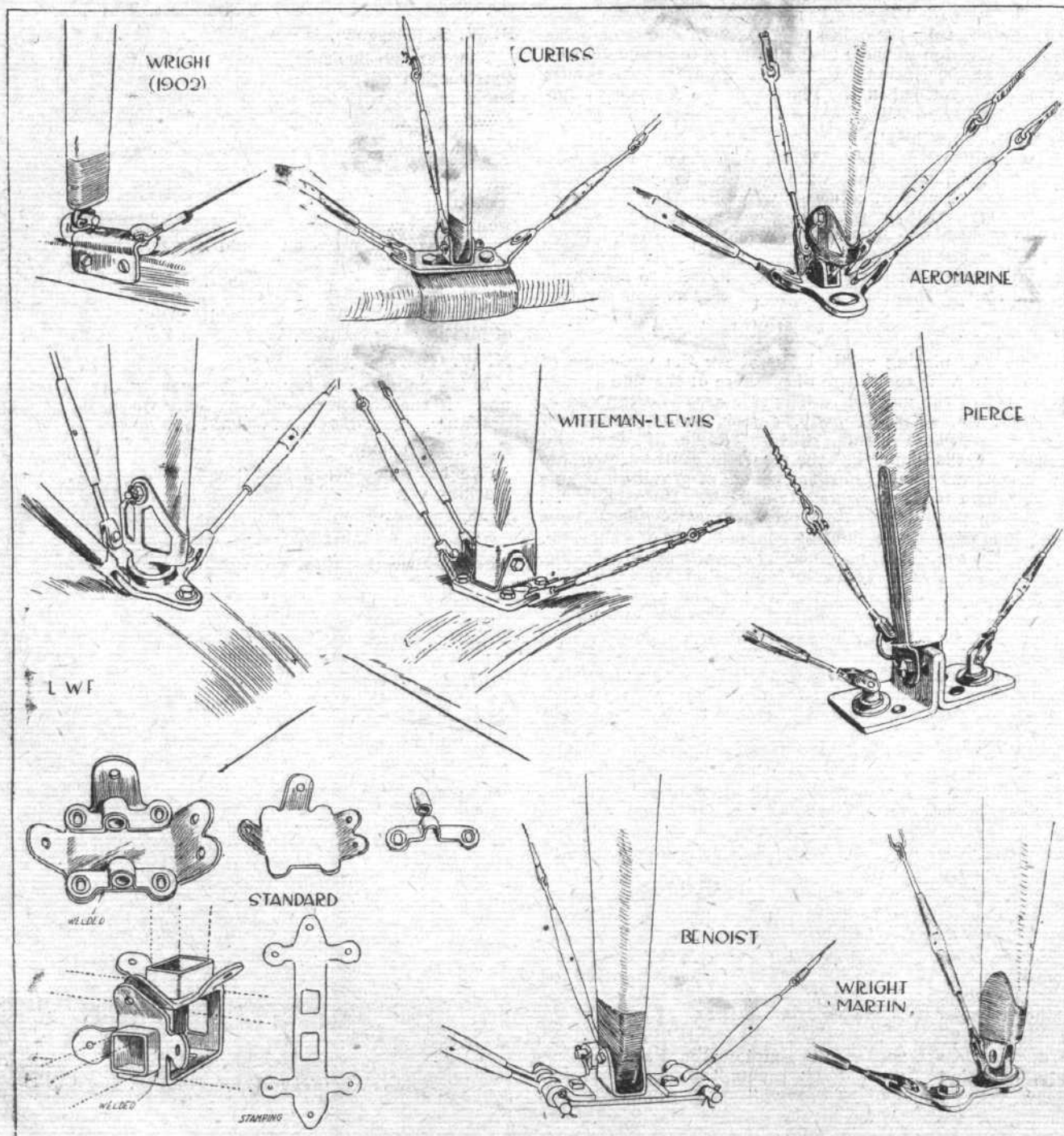
AIRISMS FROM THE FOUR WINDS

It would be very interesting to know, could it be ascertained, which pilot holds world's record for hours in the air, starting from the time he took his ticket, right up to date. A good many of the earlier flyers have given up actual air work and are devoting their abilities to construction, but there are yet a few left who are still enamoured of the air. Chatting with a well-known pilot the other day who has taken the trouble to carefully keep his air-hour record, we reckoned it roughly that he could show over 2,500 hours. Truly a goodly number; we wonder whether some other pilot can go one better.

Now the creator of the Zeppelins has passed to his long reckoning, we may well look for a revival of air frightfulness, if only by way of justifying the halo of praise with which the Hun admirers of the strafe of the British public have

adorned the dead scientist's memory. That the dead Count's name will live in history, as claimed by the Kaiser and his people downwards, there is little doubt. But hardly in the sense that the Germans suggest. Zeppelin *might* have been a man of greatness had it not been for the intervention of the war. As it is—well, even in his own land it is now generally admitted, his star was much on the wane, if it had not evaporated altogether.

At the same time, there is little question that a big effort is in the womb of the early future to make a striking attempt at effecting some big strafing coup against this country before the final smash-up becomes an accomplished fact. Recent German rumours of a close time for the Zepps., as we commented recently, are merely a puerile method of endeavouring to lull our air defences into inefficiency. That it has entirely



AT THE AMERICAN AERO SHOW.—Some constructional details. Various examples of interplane strut fittings, including the early Wright-type.

The "Automobile," N.Y.

failed is already evident from the latest "semi-official" Berlin declaration that the building of Zeppelins, so far from being suspended, is being continued on an even greater scale than before.

THAT there is likely to be something in the wind presently receives further corroboration from Paris, where the *Matin* states that four Zeppelins have just been completed at Friedrichshafen and are awaiting orders to leave that place. Moreover our contemporary further affirms that at the little town of Mauzot, not far from Friedrichshafen, fresh building yards have been constructed comprising immense two-storey workshops entirely underground, and thus completely sheltered from aerial attack. The Zeppelins at present available, it appears, are concentrated a short distance from the Dutch frontier, and the Germans, the *Matin* says, intend to use them in the course of a few weeks for an expedition on a large scale against Great Britain. Forewarned is forearmed, but, either way, the Hunnish visitors will surely find us aye ready, as or even more so than upon their last excursions.

WHATEVER the individual crews of the airships may think of the duty which falls to their lot, it is a gratifying thought that as between the two sides of the Flying Corps there is increasing evidence of the respect and admiration which obtains between the two bodies. The latest in this direction is contained in a letter which has been sent to the widow at Cottingham of Lieut. Matthews, R.F.C., killed at Salonica, enclosing the following copy of a message dropped from a German aeroplane on a British aerodrome: "The English airmen had been fighting very bravely, but after five minutes their aeroplane dropped and they were killed. They died heroes. Their bodies will be buried with all military honours."

MUCH interesting matter for reflection and comparison is contained in the writings of a journalist who, according to the *Daily Mail*, has been permitted to inspect the Döberitz aerodrome at Berlin. In the first place, he makes it very clear that we have not the entire monopoly of aerial photography, and his conclusions are well worth the consideration of those best able to provide for serving the requirements of our forces at the Front. Following upon an obvious platitude, to the effect that that which escapes the observer's eye, especially when engaging enemy airmen, is recorded by the camera, the writer continues: "A comparison between the French and English balloon-cameras and our own shows that Germany's optical workshops are far ahead of all others. They have produced cameras in contrast to which those captured from the enemy are mere playthings. The various types range from hand-cameras up to gigantic affairs weighing 4 cwt., well over 6 ft. in length. They are built into the aircraft and work by the pressure of a finger. Special stereoscopic photographs can be taken showing the relief of the land, so that when enemy fortifications have been destroyed their absence is rendered conspicuous."



A Recollection of the late Count Zeppelin.—The Kaiser with the Count, "one of the greatest sons of the Fatherland," at Zeppelin trials, before the present war.

COMING to aircraft and wireless, he says: "At the beginning of the war airmen signalled with flags or coloured lights. To-day these methods are absolutely insufficient. By the end of November, 1915, we had succeeded in fitting all our observation aircraft with wireless telegraphy, so that our observers could receive messages from the most advanced field stations. But improvements rapidly accumulated, and to-day our observers have combined sending and receiving apparatus with a sound intensifier, so that wireless communication can be maintained in both directions."



FAIR PASSENGER: "Bert, dear, don't fly so near those horrible chimneys, or you'll spoil my new hat."—*The Olympian*.

UPON the subject of the tracer bullet, which at one time the Huns openly and blatantly fell foul of, suggesting its use as a valid justification for murdering some of our captured men, the journalist states: German ingenuity has improved aerial ammunition by the invention of the incandescent bullet. In an air fight it is impossible to see where the bullet strikes, and in this matter the incandescent bullet is of the greatest service. It pursues its course like a small comet and enables the airman to correct his aim. Combined with a phosphorus bullet it becomes incendiary, with a devastating effect for balloons and aircraft. In training airmen to use the machine gun the incendiary bullet has performed excellent service, although registration by film photography is a cheaper method. Another interesting section shows the development of bombs from those weighing a few pounds up to bombs weighing 6 cwt.

"He asked me if I knew a certain police inspector in London. I said, 'Yes,' but I did not. He said, 'You heard that he died quietly in his bed.' I replied, 'Yes,' and he said, 'Yes, he died quietly in his bed with a bomb on him.' I asked, 'From a Zeppelin?' He said, 'When the Zeppelins start, so do we.'"

What a wealth of weirdness the above little episode in the evidence of Harriet Ann Wheeldon, the would-be poisoner of the Prime Minister, opens out for novelists and unsolved mysteries. The *dramatis personæ* in this drama were "Gordon" and the witness giving evidence on her own behalf.

THE following notice which hangs very prominently in a certain British aeroplane factory might well be a standing item in every similar establishment. It reads as follows:—

"NOTICE.—A concealed mistake may cause a brave man to lose his life."

Familiarity is apt to make at times the best forgetful of the vital importance of their individual share in the work as a whole.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of March, 1907. "FLIGHT" was founded in 1908.

SANTOS DUMONT'S NEW MACHINE.

M. Santos Dumont's new aeroplane is so far advanced towards completion that he has had it out of the shed and given it an airing. M. Dumont intends to affix a V-shaped wind-shield of celluloid in front of the position he will himself occupy. He considers the new machine much more likely to be successful than the old one, but he intends providing it with a speed indicator, and will not adjust the rudder so as to cause it to tend to rise from the ground till it attains a pace of 70 kiloms. per hour. To someone asking him what height he expected to rise to, M. Santos Dumont said that if he succeeded in winning the great prize for accomplishing a kilometre and returning to the starting point without touching ground at only a height of a metre from the surface, he would be more than delighted.

ANOTHER ACCIDENT TO THE DELAGRANGE AEROPLANE.

The Delagrane aeroplane went out again on the 7th inst., having been repaired since its accident on the 28th ult., and was just expected to leave the ground, after running for some 30 metres along the surface, when the engine seemed to give a jump, and two vertical struts gave way, fouling the propeller, which was thrown out of the true. Fortunately M. Voisin, who was at the wheel, escaped without injury.

M. JOSE WEISS' MODELS.

M. Weiss is not only an artist, but is interested in aero-

nautics as well. He has been very successful in designing model gliders, which closely resemble birds on the wing in soaring flight. At a meeting last week of the Aeronautical Society, of which he is a member, several of these models flew successfully. In his lecture upon "The Theory of Sailing Flight," M. Weiss explained that one of these models had been timed when hovering in the air, against a fresh breeze, for 40 seconds by a stopwatch. He displayed a small flock of models, many of which flew for some 40 ft. across the room with remarkable steadiness.



Casualties.

Major MAURICE ADAM BLACK, Dragoon Guards, attached R.F.C., previously officially reported "missing, believed killed," now unofficially reported killed on February 11th, during an air fight, was the elder son of the late Adam William Black, of Edinburgh, and Mrs. Black, of Aston Park, Wem, Shropshire. In October, 1914, he was severely wounded in France, and was unable to rejoin his regiment till August, 1915, but in two months' time he was invalided home again through complications of his old wound. Finding himself incapacitated from again serving with his regiment in an active capacity, he joined the R.F.C., soon gaining his wings. He went to France, and was shortly promoted Flight Commander, and went to another front last September. Major Black, as stated on March 1st, was a splendid all-round athlete and sportsman, representing Cambridge at Rugby football in 1897-8, and afterwards he played for his regiment in all inter-regimental polo tournaments. He was a keen big-game shot and cross-country rider, winning many point-to-point races and the Army "Point-to-Point" run near Rugby in 1914. He married in 1903 Ethel Maud Goldney, younger daughter of Mr. George Goldney, of Chippenham House, Exmouth, Devon, and leaves a daughter.

Major EVELYN PAGET GRAVES, R.F.C., and Capt. R.F.A., killed in an air fight on March 6th, was 26 years of age and the eldest son of Major the Hon. A. E. P. Graves, of Queen Anne's Mansions. Major Graves passed out of Woolwich into the Royal Artillery in December, 1910, and had promotion in December, 1913. He entered the R.F.C. in October, 1914, and in June of last year was appointed Squadron Commander.

Lieutenant THOMAS SEAMAN GREEN, R.F.C., who was killed on February 13th, aged 22, was the elder son of Mr. and Mrs. T. S. Green, of Burslem, Stoke-on-Trent. He was educated at King William's College, Isle of Man, and on the outbreak of war enlisted in the 5th North Staffordshire Regiment, and was granted a commission in another battalion of the same regiment in December, 1914, being transferred to the Royal Flying Corps in January, 1916. He had been serving as a pilot at the front since June, and for the last few weeks had been acting commander of his flight. Lieutenant Green was the officer who was deputed to carry over and drop a wreath to the memory of the late Captain Boelke, the famous German airman. His senior officer writes:—"Your son was loved by us all, and his death has left a gap in our mess which can never be filled. His courage was magnificent, and it is impossible to estimate too highly his splendid work out here. His death was just as magnificent, and it was brought about while engaging Hun machines in considerably superior numbers. His greatest joy was a fight with enemy machines. I say with absolute sincerity that I have never met anyone out here possessing greater courage. It was an honour indeed to command such a son as yours."

Lieutenant BERESFORD WINNINGTON HILL, R.F.C., who was killed on March 4th, was the only son of Thomas Hill, of East View, Uxbridge (formerly of Parkside, Ewell). Born in 1892 he was educated at Mr. Worsley's, Evelyns, Hillingdon, and at Malvern College, where he held a classical scholarship. On leaving Malvern he was given a leaving scholarship, and he also won an open classical scholarship at Magdalene College, Cambridge, and went up in October, 1911, taking his degree in 1914. He served in the Cambridge O.T.C. for three years, and on the outbreak of war was given a commission in the Rifle Brigade. He went to the front in July, 1915, and was wounded in October, 1915. On his recovery he entered the Royal Flying Corps in April, 1916, and returned to the front as a pilot last February.

Lieutenant WILLIAM FREDERICK WALLER HILLS, R.F.C., killed in action on March 6th, was the elder son of Colonel E. H. Hills, C.M.G., F.R.S., and of Mrs. Hills, 1, Campden Hill. Born in 1893, he was educated at Horris Hill and Eton, and at the outbreak of war he had just completed his second year as an undergraduate at Trinity College, Cambridge. He obtained a commission as Second Lieutenant in the R.F.A., and was a member of the first Salonica Expeditionary Force, taking part in the advance into Serbia. He returned to England in May, 1916, in order to join the R.F.C. Immediately on completion of his training he was appointed Instructor, and after a short period joined a service squadron and went to the Front in January last. Lieutenant Hills married in October, 1914, Agnes, daughter of the late Hon. Walter Sugden and of Lady Agnes Sugden, and leaves an infant son. His younger brother, Second Lieutenant Charles Herbert Hills, the Manchester Regiment, was killed on the Somme front last September.

Midshipman EDWARD RUPERT SNOW, R.N., who was killed on active service on March 3rd, aged 18, was the eldest son of the late Colonel E. B. Snow, R.M.L.I., and of Mrs. Snow. He was educated at the Royal Naval College, Osborne, passing into Dartmouth just before war broke out. After one term there he was posted to the "Lord Nelson," and in addition to other service was present at both the evacuations of the Gallipoli Peninsula. Then his great desire to fly led him to offer himself for the Naval Air Service, in which he unfortunately met his death while flying. He was a good all-round athlete, and at Osborne was in the elevens of his term. He was a born sailor and keen on his profession, and his popularity at school and Osborne followed him into the Navy. His father, who was in the Royal Marine Light Infantry, served in the Baltic 1857 and 1858, and was specially promoted by Queen Victoria in an Order in Council for services during the visit of the late King Edward, when Prince of Wales, to India, on which occasion Colonel Snow commanded the Royal Marines forming the guard of honour on the "Serapis."

Flight Sub-Lieutenant JOHN ERIC NORTHROP, R.N.A.S., accidentally killed while flying, was the second son of Mr. and Mrs. Alfred Northrop, of Blenheim Lawn, Manningham, Bradford. He was educated at Uppingham and Clare College, Cambridge, and was 22 years of age.

Married and to be Married.

The marriage between Lieutenant PAUL FRANCIS WHEELER BUSH, R.F.C., eldest son of the late Robert Francis Evans Bush, of Oakfield, Rugby, and KATHLEEN, youngest daughter of the late WYKEHAM BOURNE and Mrs. BOURNE, of 53, Oxford Gardens, W., will take place on the 29th inst., at 11 o'clock, at St. Stephen's Church, Westbourne Park.

The marriage took place quietly on March 13th at Stanton-on-the-Wolds, Nottinghamshire, of Capt. H. LLOYD CHADWICK, R.F.C., eldest son of Mr. and Mrs. Lloyd Chadwick, of Warwick, to DOROTHEA MORFETT, youngest daughter of the late Charles KNIGHT and Mrs. KNIGHT, of Stanton-on-the-Wolds, Nottinghamshire.

The marriage of Lieutenant RALPH ERSKINE, R.F.C., and JANE LENNOX, only daughter of Mr. and Mrs. WILLIAM HIGGINS, Glenafton, Wimbledon, took place at St. Columba's Church, Pont Street, on March 9th.

The engagement is announced of Captain W. LEEER ROBINSON, V.C., Worcester Regiment, attached R.F.C., to Mrs. JOAN U. WHIPPLE, widow of Captain H. C. Whipple, Devonshire Regiment, and daughter of Mr. Gerald Stapylton-Smith, of Hutton, Essex.

METHODS OF MEASURING AIRCRAFT PERFORMANCES.

By Captain H. T. TIZARD, R.F.C.

(Continued from page 233.)

THE aneroid being what it is, one soon comes to the conclusion that the only way to make use of it in aeroplane tests is to treat it purely as a pressure instrument. For this reason it is best to do away with the zero adjustment for all test purposes and lock the instrument so that the zero point on the height scale corresponds to the standard atmospheric pressure of 29.9 ins. or 760 mm. of mercury. Every other height then corresponds to a definite pressure; for instance, the locked aneroid reads 5,000 ft. when the atmospheric pressure is 24.88 ins., and 10,000 ft. when it is 20.70 ins., and so on. If the temperature is noted at the same time as the aneroid reading, we then know both the atmospheric pressure and temperature at the point, and hence the density can be calculated, or, more conveniently, read off curves drawn for the purpose. The observations necessary (after noting the gross aeroplane weight, and nett or useful weight carried) are therefore, (i) aneroid height every 1,000 ft.; (ii) time which has elapsed from the start of the climb; and (iii) temperature; to these should be added also (iv) the air speed and (v) engine revolutions at frequent intervals. The observed times are then plotted on squared paper against the aneroid heights and a curve drawn through them. From this curve the rate of climb at any part (also in aneroid feet) can be obtained by measuring the tangent to the curve at the point. This is done for every 1,000 ft. by aneroid. The true rate of climb is then obtained by multiplying the aneroid rate by the correction factor corresponding to the observed temperature. These true rates are then plotted afresh against standard heights and from this curve we can obtain the rates of climb corresponding to the standard heights 1,000, 2,000, 3,000, &c. Knowing the change of rate of climb with height, the time to any required height is best obtained by graphical integration. The following table gives the results of an actual test:—

TABLE IV.—Machine..... Engine.....
Date 27th December, 1916.

Height in Aneroid ft.	Observed temp. ° F.	Percentage of standard den- sity.	Observed time.	Rate of climb in Aneroid ft.	Real rate of climb (corrected for temp.).	From Curve.			
						Standard height.	Percentage of standard density.	Time.	Rate of climb.
0	36		0.0						
1,000	37	101.0	1.0	835	814	1,000	99.40	1.20	775
2,000	38	97.2	2.10	735	718	2,000	96.30	2.56	685
3,000	36	94.0	3.70	640	622	3,000	93.26	4.11	610
4,000	36	90.7	5.40	560	544	4,000	90.25	5.85	545
5,000	36	87.4	7.25	510	495	5,000	87.35	7.80	490
6,000	33	84.7	9.40	450	435	6,000	84.50	9.96	435
7,000	30	82.1	11.90	405	389	7,000	81.80	12.40	385
8,000	26	79.9	14.25	365	347	8,000	79.16	15.14	345
9,000	22	77.6	17.00	330	312	9,000	76.55	18.20	310
10,000	23	74.7	20.25	310	294	10,000	74.00	21.61	280
11,000	21	72.2	23.60	280	264	11,000	71.70	25.41	245
12,000	20	69.8	27.40	230	216	12,000	69.50	29.81	210
13,000	17	67.7	31.90	195	182	13,000	67.32	35.13	170
14,000	12	65.9	37.90	150	139	14,000	65.17	41.88	130
15,000	8	64.1	45.25	110	101	14,500	64.11	46.23	105

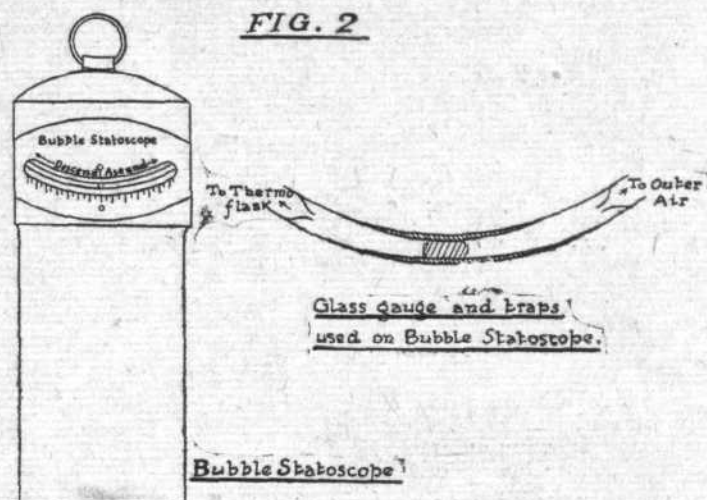
At least two climbing tests of every new machine are carried out up to 16,000 ft. or over by aneroid. If time permits three or more tests are made. The final results given are the average of the tests and represent as closely as possible the performance on a standard day, with temperature effects, up-and-down currents and other errors eliminated.

If we produce the rate of climb curve upwards it cuts the height axis at a point at which the rate of climb would be zero, and therefore the limit of climb reached. This is the "ceiling" of the machine.

Speeds.

His 16,000 ft., or whatever it is, reached, the flyer's next duty is to measure the speed flying level by air speed indicator

at regular intervals of height (generally every 2,000 ft.) from the highest point downwards. To do this he requires a sensitive instrument which will tell him when he is flying level. The aneroid is quite useless for this purpose, and a "statoscope" is used. The principle of this instrument is really



the same as that of a climbmeter. It consists of a thermos flask connected to a small glass gauge, slightly curved, but placed about horizontally. In this gauge is a small drop of liquid, and at either end are two glass traps which prevent the liquid from escaping either into the outside air or into the thermos flask. As the machine ascends and the atmospheric pressure being smaller, and the pressure in the flask being higher than the external pressure, the liquid is pushed up to the right-hand trap, where it breaks, allowing the air to escape. On descending the reverse happens; the liquid travels to the left, breaks, and air enters the flask. When flying truly level the drop remains stationary, moving neither up nor down. The instrument is made by the British Wright Co.

The flyer or the observer notes the maximum speed by the air speed indicator, *i.e.*, the speed at full engine throttle. At one or more heights also, he observes the speeds at various positions of the throttle down to the minimum speed which will keep the machine flying at the height in question. The petrol consumption and the engine revolutions are noted at the same time, as well, of course, as the aneroid height and temperature. Accurate observation of speeds needs very careful flying—in fact much more so than in climbing tests. If the air is at all bumpy observations are necessarily subject to much greater error since the machine is always accelerating and decelerating. The best way to carry out the test seems to be as follows: The machine is flown first just down hill and then just up hill and the air speeds noted. This will give a small range between which the real level speed must lie. The flyer must then keep the speed as steadily as possible on a reading midway between these limits, and watch the statoscope with his other eye. If it shows steady movement, one way or the other, the air speed must be altered accordingly by 1 m.p.h. In this way it is always possible at heights where the air is steady to obtain the reading correct at any rate to 1 m.p.h., even with light machines, provided always sufficient patience is exercised. The revolutions per minute at this speed are then noted.

One difficulty, however, cannot be avoided. If at any height there is a steady up or down air current, then though the air may appear calm, *i.e.*, there may be no "bumps," the air speed indicator reading may be wrong, since to keep the machine level in an up current it is necessary to fly slightly down hill relatively to the air. Such unavoidable errors are, however, eliminated to a large extent by the method of taking speeds every 2,000 ft., and finally averaging the results.

(To be concluded.)

The Aeronautical Society's Lectures.

OWING to the difficulty in obtaining good films in the present dull weather, the lecture announced by the Aeronautical Society for March 21st by Mr. Holt Thomas on

"Commercial Aeronautics" has been postponed until May 20th.

Mr. M. A. S. Riach will deliver his Paper on "Air Screws" on March 21st, the meeting place, as usual, being the Society of Arts, John Street, Adelphi, W.C.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

Admiralty, March 7th.

The under-mentioned granted temp. commissions as Sub-Lieuts., R.N.V.R., and appointed to "President," additional, for R.N.A.S., to date as stated: G. A. Harrison, Mar. 3rd; and W. B. Sinclair, Mar. 6th.

The following entered as Temp. Prob. Flight Officers, and appointed to "President," additional, for R.N.A.S., both to date Mar. 11th: A. E. Dyer and R. Brown.

W. H. Evans entered as Prob. Flight Officer for temp. service, and appointed to "President," additional, for R.N.A.S., to date Feb. 23rd.

Ldg. Mech. J. E. Osborn promoted to Temp. Warrant Officer, 2nd grade, and appointed to "President," additional, for R.N.A.S., to date Mar. 3rd.

Admiralty, March 9th.

W. J. Walker granted temp. commission as Lieut., R.N.V.R., with seniority Mar. 5th.

The following entered as Prob. Flight Officers for temp. service, all with seniority Mar. 11th: J. R. Pattison, J. I. A. Rossington-Barnett, E. Morris, E. W. T. Russell, E. Forster, J. M. Ogden, J. Durston, C. B. Cook, G. White, R. W. Helmsley, G. H. Barraclough, D. B. G. Francis, D. H. Carey and C. E. Emerson.

Admiralty, March 10th.

W. G. Everingham granted a temp. commission as Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., to date Mar. 8th.

Temp. Flight-Lieut. A. Brind re-appointed as Temp. Actg. Flight-Com., to date Mar. 8th.

E. E. Hardie entered as Prob. Flight Officer for temp. service, and appointed to "President," additional, for R.N.A.S., to date Mar. 18th.

Air-Mech., 2nd grade, B. C. Bennett promoted to Temp. Warrant Officer, 2nd grade, with seniority Mar. 8th.

Royal Flying Corps (Military Wing).

London Gazette, March 6th.

Squadron Commanders.—From Flight-Coms., and to be Temp. Majors whilst so employed: Capt. G. R. Howard, D.S.O., Essex R., S.R.; Jan. 5th. Capt. H. B. Davey, M.C., N. Staff. R. (T.F.); Jan. 7th. Lieut. (Temp. Capt.) V. D. Bell, S.R.; Feb. 1st. Capt. J. U. Kelly, D.S.O., Wilts. R.; Feb. 3rd.

Flight-Commander.—Temp. 2nd Lieut. R. W. Scoles, Gen. List, from a Flying Officer, and to be Temp. Capt. whilst so employed; Feb. 16th.

Flying Officers.—Feb. 14th: Temp. Lieut. H. H. W. Bean, Northd. Fus., and to be transfd. to Gen. List; Lieut. F. R. R. Woodward, Lan. Fus., S.R., and to be sec'd.; 2nd Lieut. (Temp. Lieut.) A. W. Martin, York. R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. L. Murray-Stewart, R. Highrs., and to be transfd. to Gen. List; Temp. 2nd Lieut. W. G. Barker, M.C., Gen. List, from a Flying Officer (Obs.), with seniority from Sept. 22nd. Feb. 15th: Temp. 2nd Lieut. A. Roulstone, Notts. and Derby. R., and to be transfd. to Gen. List; 2nd Lieut. (on prob.) R. E. Littell, S.R. Temp. 2nd Lieut. D. B. King, attd. L'pool. R., and to be transfd. to Gen. List; Feb. 16th.

Balloon Officers.—Temp. Lieut. G. S. M. Warlow, Army Cyclist Corps, and to be transfd. to Gen. List; Jan. 2nd, but with seniority from June 6th. Temp. 2nd Lieut. R. P. Lamb, Rif. Brig., and to be transfd. to the Gen. List; Jan. 3rd. Jan. 17th: 2nd Lieut. C. T. S. Mendl, Devon. R., S.R., and to be sec'd.; 2nd Lieut. (on prob.) A. J. J. Lamb, S.R. Jan. 31st: Temp. 2nd Lieut. (on prob.) M. L. J. Daly, Gen. List; 2nd Lieut. B. H. Morrison, Unattd. List, Ind. Army.

Park Commander.—The appointment of Lieut. (Temp. Major) L. M. Bennett, S.R., notified in the Gazette of Feb. 3rd, is antedated to Jan. 9th.

Equipment Officers, 3rd Class.—2nd Lieut. (Temp. Lieut.) F. G. Brown, R.F.A. (T.F.), and to be sec'd.; Dec. 15th. The notification in the Gazette of Jan. 15th regarding Lieut. F. G. Brown, R.F.A. (T.F.), is cancelled. 2nd Lieut. E. W. Walford, S.R.; Jan. 8th. 2nd Lieut. H. A. C. Parker, S.R.; Feb. 1st. 2nd Lieut. F. M. Harding, S.R.; Feb. 8th.

Memorandum.—Temp. 2nd Lieut. H. Bromley, R.E., to be Temp. Capt. whilst employed with R.F.C.; Feb. 2nd.

London Gazette Supplement, March 7th.

Wing Commander.—Major F. J. L. Cogan, R.A., from a Sqdn. Com., and to be Temp. Lieut.-Col. whilst so employed; Feb. 8th.

Flying Officers.—Feb. 13th: 2nd Lieut. (on prob.) H. G. Ross, R.E. (T.F.), and to be sec'd.; Temp. 2nd Lieut. H. E. Hervey, Gen. List, from a Flying Officer (Obs.), with seniority from June 14th; 2nd Lieut. (on prob.) N. H. England, S.R. Feb. 14th: Lieut. R. G. Bennett, S.R., from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. (on prob.) S. J. Stewart, Gen. List; Temp. 2nd Lieut. W. Mason, Gen. List. Temp. 2nd Lieut. (on prob.) W. S. Morrison, Gen. List; Feb. 15th.

Flying Officers (Observers).—Lieut. F. L. B. Hebbert, R.F.A., S.R.; Aug. 25th. The notification in the Gazette of Sept. 14th regarding Temp. Lieut. F. L. B. Hebbert, R.F.A., is cancelled. Temp. 2nd Lieut. H. J. Bennett, Gen. List; Jan. 23rd, but with seniority from Oct. 15th. Temp. Lieut. E. L. Burrell, Gen. List; Dec. 28th, but with seniority from Oct. 19th.

Balloon Officers.—Jan. 2nd: Capt. L. I. F. Muirhead, High. Cyclist Bn. (T.F.), and to be sec'd.; 2nd Lieut. (Temp. Capt.) G. C. Cheshire, Ches. R. (T.F.), and to be sec'd. 2nd Lieut. S. Wilkinson, S.R., from an Equipment Officer, 3rd Cl.; Jan. 17th. Jan. 31st: Temp. 2nd Lieut. P. Leigh, Gen. List; Temp. 2nd Lieut. E. Holman, Gen. List. Feb. 19th: Temp. Lieut. H. D. Lewis, R.A., and to be transfd. to Gen. List, with seniority from June 7th; 2nd Lieut. D. M. Hodgson, E. York. R. (T.F.), and to be sec'd., with seniority from May 23rd.

Adjutant.—Temp. Lieut. H. Parker-Jervis, Rif. Brig., and to be transfd. to Gen. List, vice Temp. Lieut. R. C. Lane, Gen. List; Feb. 15th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. to be Lieuts.:—Feb. 1st: C. A. Lewis, M.C., (Temp. Lieut.) T. L. F. Burnett, (Temp. Capt.) R. W. Heath, J. Elgood, A. J. Hamar, H. C. G. Watney, F. H. Humphreys, L. I. T. Hewer, (Temp. Lieut.) C. G. Jones, (Temp. Lieut.) G. L. Main, W. E. Roe, R. W. Young, (Temp. Capt.) R. J. Bennett, A. H. L. Beale, P. Arbon.

London Gazette Supplement, March 8th.

Staff Officer, 2nd Class (graded for pay as a Brigade Major).—Capt. G. B. Fraser, King Edward's Horse, S.R., from an Adj.; Feb. 13th.

Squadron Commander.—Major E. H. M. O'Farrell, R. Ir. Fus., from a Flight-Com.; Feb. 16th.

Flying Officers.—2nd Lieut. (Temp. Lieut.) J. C. Macgown, Yeo. (T.F.), and to be sec'd.; Feb. 13th. Feb. 14th: Capt. G. E. Chadwick, M.C., E. Lan. R., and to remain sec'd.; Temp. 2nd Lieut. (on prob.) (Actg. Lieut.) R. Cornford, Training Res. Bn., to relinquish his acting rank, and to be transfd. to Gen. List; 2nd Lieut. A. M. Sutherland, Northd. Fus. (T.F.), and to be sec'd.; Temp. 2nd Lieut. K. R. Kirkman, Leic. R., and to be transfd. to Gen. List; Capt. G. E. F. Sutton, M.C., Canadian Inf. Bn., from a Flying Officer (Obs.), with seniority from July 13th. Feb. 15th: Temp. 2nd Lieut. P. W. B. Lawrence, attd. D. of Corn. L.I., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) G. O. Maugham, Gen. List. Feb. 17th: Temp. 2nd Lieut. F. T. Bright, Suff. R., and to be transfd. to Gen. List; 2nd Lieut. (on prob.) J. C. Smith, R. War. R., S.R., and to be sec'd.; 2nd Lieut. (on prob.) T. P. W. Young, High. L.I. (T.F.), and to be sec'd.; 2nd Lieut. W. Whittaker, Lan. Fus. (T.F.), and to be sec'd.; 2nd Lieut. J. A. Stedman, R.F.A. (T.F.); Temp. 2nd Lieut. J. H. P. Kither, Gen. List. Feb. 18th: 2nd Lieut. C. H. Stevens, S.R.; 2nd Lieut. H. A. Hamersley, S.R.; Temp. 2nd Lieut. (on prob.) L. G. Harrison, Gen. List.

Flying Officers (Observers).—Lieut. E. Sassoon, D. Gds., from Oct. 21st, 1915, to Jan. 9th, 1917. Lieut. J. W. Sanders, Middx. R. (T.F.), and to be sec'd.; Sept. 15th, with seniority from July 29th. Temp. 2nd Lieut. F. W. Griffiths, attd. Middx. R., and to be transfd. to Gen. List; Sept. 1st, with seniority from July 30th. Temp. 2nd Lieut. N. Cox-Walker, York. R., and to be transfd. to Gen. List; Jan. 11th, with seniority from Aug. 2nd. Temp. 2nd Lieut. O. A. E. Allen,

Suff. R., and to be transfd. to Gen. List; Feb. 20th, with seniority from Sept. 16th. Feb. 14th: Temp. 2nd Lieut. (on prob.) A. S. Carey, Gen. List, with seniority from Oct. 15th. Temp. 2nd Lieut. A. S. Mackenzie, High. L.I., and to be transfd. to Gen. List, with seniority from Oct. 17th. Temp. 2nd Lieut. T. Johnson-Gilbert, R. Scots, and to be transfd. to Gen. List; Feb. 18th, with seniority from Oct. 20th. Temp. 2nd Lieut. W. G. Scotcher, M.C., attd. E. York. R., and to be transfd. to Gen. List; Feb. 17th, with seniority from Oct. 20th. 2nd Lieut. F. W. Burdick, Lond. Divl. Cyclist Cos., and to be sec'd.; Feb. 14th, with seniority from Oct. 28th. Lieut. A. S. Allan, M.C., Can. Inf. Bn.; Feb. 18th, with seniority from Nov. 7th. Lieut. G. A. Good, Can. Inf. Bn.; Feb. 15th, with seniority from Nov. 9th. Temp. Lieut. J. A. V. Boddy, Durh. L.I., and to be transfd. to Gen. List; Feb. 18th, with seniority from Nov. 10th. Temp. 2nd Lieut. (on prob.) L. L. Brown, Gen. List; Feb. 11th, with seniority from Nov. 21st. Feb. 14th: Temp. 2nd Lieut. (on prob.) H. R. Wilkinson, Gen. List, with seniority from Nov. 21st. Temp. 2nd Lieut. (on prob.) A. C. Perryman, Middx. R., and to be transfd. to Gen. List, with seniority from Nov. 25th. Feb. 18th, with seniority from Dec. 2nd: 2nd Lieut. T. Margerison, Hunts. Cyclist Bn. (T.F.), and to be sec'd.; 2nd Lieut. (on prob.) H. C. Bankart, Middx. R., S.R., and to be sec'd.; 2nd Lieut. (on prob.) A. H. Margoliouth, Yorks. L.I. (T.F.), and to be sec'd.; Temp. 2nd Lieut. (on prob.) E. D. Inskip, Gen. List. Temp. 2nd Lieut. (on prob.) H. A. Dyer, Gen. List; Feb. 18th, with seniority from Dec. 11th. Feb. 14th: Lieut. J. F. Procter, Can. Inf. Bn., with seniority from Dec. 20th. Temp. 2nd Lieut. L. V. Munn, Leic. R., and to be transfd. to Gen. List, with seniority from Dec. 23rd. Feb. 20th, with seniority from Dec. 29th: Lieut. J. R. Geddes, Can. Gen. List; 2nd Lieut. V. G. Southern, M.C., York. and Lanc. R., and to be sec'd. The rank of Lieut. E. J. D. Townesend, R.A., is as now described, and not as in the *Gazette* of Feb. 15th.

Balloon Officers.—Jan. 31st: Temp. Lieut. E. B. Matthews, R. Berks. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. W. J. Reid, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. A. G. Tremain, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. B. O. Butler, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. (on prob.) J. Toulmin, Gen. List; Temp. 2nd Lieut. A. Smellie, Gen. List, from an Equipment Officer, 3rd Cl.

Adjutant.—Capt. A. P. Pargiter, M.C., R. Ir. Regt., and to be sec'd.; Jan. 12th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. T. Jones, Gen. List; Nov. 30th. 2nd Lieut. (on prob.) W. S. C. Stephens, S.R.; Dec. 30th. 2nd Lieut. C. W. Alexander, S.R.; Jan. 4th. 2nd Lieut. R. Knott, S.R.; Jan. 8th. Feb. 12th: 2nd Lieut. F. T. Hill, S.R.; Temp. 2nd Lieut. (on prob.) C. W. Waitt, Gen. List.

Schools of Military Aeronautics.

Assistant Instructor (graded as Equipment Officer, 2nd Class).—2nd Lieut. W. J. King, N. Staff. R., from an Equipment Officer, 3rd Cl., and to be Temp. Lieut. whilst so employed; Feb. 14th.

Memorandum.—Sub-Lieut. J. Thompson from R.N.V.R., to be Temp. Lieut. on Gen. List for duty with R.F.C.; Jan. 20th, but with seniority from Oct. 28th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: D. H. Blaikie, M. M. Merriman, P. W. Renshaw, J. G. Thompson, C. W. Alexander, R. Knott, B. C. Adamson, F. T. Hill, H. N. O'Donnell, H. F. L. Dixon, C. H. Stevens, R. E. Littell, N. H. England, H. A. Hamersley. The under-mentioned to be 2nd Lieuts. (on prob.):—Feb. 16th: G. A. Lush, D. J. Parry. The surname of 2nd Lieut. (on prob.) H. A. Hamersley is as now described, and not as in the *Gazette* of Nov. 22nd.

General List.—The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.):—Feb. 27th: F. St. K. Anderson, B. St. J. H. Atteridge, P. G. Angood, C. L. Adamson, R. W. Anderson, J. Adam, C. A. Bainbridge, F. Barrie, H. A. Blain, W. R. Brookes, D.C.M., C. D. Barnard, P. S. Burge, E. D. Bonisteel, L. W. Bristo, M. O. Baumann, J. F. T. Barrett, F. H. Brown, D. J. Barnes, N. D. Budgen, E. C. Clark, P. J. Cox, N. H. Crow, A. J. Chambers, V. C. Coombs, H. C. Chambers, O. Clayton, E. B. Crickmore, C. E. Crowley, J. A. C. Eoston, J. A. Carruthers, C. H. Drew, R. Davis, S. J. Davies, T. G. Dixon, G. D. Daly, D. W. Dron, A. E. J. Dobson, F. H. Davies, H. J. Ellam, H. E. Eaton, N. Fitzgerald-Eager, E. Foster, R. H. G. Fenner, G. A. Fennemore, F. J. Foster, A. H. Gilbert, A. C. Goldsmith, H. P. Griffiths, J. E. Goodman, H. M. Gardiner, E. R. Greenhow, A. A. G. Grace, E. Greenwood, L. J. Gower, H. N. Hampton, H. R. Hodgson, H. V. Hall, F. W. Higgins, H. A. Hope, H. H. Deering, E. D. Haller, R. A. Harting, E. Holdsworth, S. H.

Harland, H. P. J. G. Hamel, N. S. Huslop, S. C. Harker, A. A. Harris, W. V. Jakins, S. V. D. D. Jones, A. H. Jarvis, J. T. P. Jeyes, P. F. Kent, W. G. Kewley, H. W. Knowlson-Williams, A. S. Kelly, J. Kelly, C. N. L. Lomax, K. Loughlin, L. W. Lowen, M. Lowe, W. Luke, C. T. Lovell, R. W. Mouritzen, C. B. Millett, W. W. A. R. Murdoch, C. L. P. Mullany, A. Milner, D. M. McGoun, J. E. C. MacVicker, R. A. McLaren, E. W. Morris, A. E. Muncaster, H. E. MacFarlane, K. Le G. Mills, E. B. Mercer, J. G. Moore, A. A. McConnell, F. Moore, R. E. Money-Lyrie, G. McPherson, I. D. R. McDonald, L. H. Mills, S. B. Martin, J. B. Mudusley, T. H. Newsome, G. L. Newman, G. A. Nicholson, G. Norrish, E. R. Ortner, M. G. M. Oxley, D. H. Ogden, J. A. O'Sullivan, G. R. C. Oliver, D. D. Phillips, H. B. Pett, A. E. Parks, J. R. Preece, C. F. K. Pierson, R. T. Paton, W. H. Peacock, R. G. Pratt, V. G. B. Parton, D. J. Pilmore-Bedford, S. M. Park, G. N. Prout, N. C. Phear, G. A. H. Parkes, R. H. Reece, C. R. Rawbone, H. W. Reynard, D. T. C. Rundle-Woolcock, L. W. Ramage, P. J. Rodocanachi, J. Reekie, H. F. Stevens, R. H. Sawyer, J. D. P. Schofield, W. H. Stevenson, W. C. Smith, T. M. Sturgess, C. B. Simpson, G. Sulman, L. O. Spain, R. D. Starley, C. L. Smith, D. W. Sibley, P. L. Smith, L. M. Shadwell, C. M. Sayer, D. W. Stacey, S. C. Sillem, G. L. T. Stooke, J. Stevenson, D. J. Sheehan, N. J. Taylor, W. H. Taylor, S. H. Taylor, R. D. K. Taylor, H. R. Tyler, R. Trattles, E. Vredenburg, E. S. Weiss, T. M. Willett, F. A. Watson, H. J. Watlington, J. L. Warwick, W. E. Warden, H. H. Wood, W. J. Watson, W. E. Watts, L. P. Wallis, F. Worswick, J. P. White, D. A. Wright, S. Walthe, W. Walker, G. R. Wight, J. S. Wood.

London Gazette, March 9th.

Brigade Commander.—Brevet-Major G. S. Shephard, M.C., R. Fus. (from Wing Com. and Temp. Lieut.-Col., R.F.C.), and to be Temp. Brig.-Gen. whilst so employed, vice Brevet Lieut.-Col. (Temp. Brig.-Gen.) D. Le G. Pitcher, Ind. Army; Feb. 8th.

Flying Officers (Observers).—Nov. 15th, 1916, with seniority from the dates shown against their names: Temp. 2nd Lieut. H. A. T. Trier, Gen. List; Aug. 23rd, 1915. 2nd Lieut. W. L. Mills, R.A., and to be sec'd.; Dec. 28th, 1915. Lieut. W. A. Bishop, Can. Gen. List; Jan. 18th, 1916. Temp. Lieut. H. A. V. Hill, Gen. List; March 7th, 1916. Temp. Lieut. S. Stretton, Gen. List; March 16th, 1916. 2nd Lieut. W. J. Wyatt, Devon. R., and to be sec'd.; March 16th, 1916. Capt. H. E. F. Wyncoll, M.C., Notts. and Derby. R., and to be sec'd.; March 21st, 1916. 2nd Lieut. R. M. Chaworth-Musters, Leic. R., and to be sec'd.; March 21st, 1916. Temp. 2nd Lieut. A. V. Blenkiron, attd. Som. L. I., and to be transfd. to the Gen. List; March 21st, 1916. Temp. 2nd Lieut. J. H. Chester Walsh, A.S.C., and to be transfd. to the Gen. List; March 21st, 1916. Temp. 2nd Lieut. A. Hughes, Gen. List; April 16th. Temp. 2nd Lieut. E. M. Roberts, Gen. List; April 16th. 2nd Lieut. (Temp. Capt.) T. Capel, A.S.C., and to be sec'd.; April 19th. Temp. Lieut. G. K. G. Kerr, Shrops. L.I., and to be transfd. to the Gen. List; April 23rd. Lieut. G. A. H. Trudeau, R. Can. R.; April 30th. Temp. 2nd Lieut. R. F. Browne, Gen. List; April 30th. 2nd Lieut. R. V. Tivy, Lond. R. (T.F.), and to be sec'd.; May 1st. Temp. 2nd Lieut. C. Baines, York and Lanc. R., and to be transfd. to the Gen. List; May 1st. Lieut. A. B. Thorne, R.F.A., S.R.; May 2nd. Temp. 2nd Lieut. C. E. Pither, Gen. List; May 2nd. 2nd Lieut. (Temp. Lieut.) W. H. Bragg, R.F.A. (T.F.), and to be sec'd.; May 14th. 2nd Lieut. A. A. Watson R.F.A. (T.F.), and to be sec'd.; May 15th. Temp. 2nd Lieut. L. W. B. Parsons, Gen. List; May 15th. Temp. 2nd Lieut. C. P. Creighton, Gen. List; May 19th. Temp. Lieut. A. G. Diamond, Gen. List; May 21st. Capt. G. L. Watson, W. York. R. (T.F.), and to be sec'd.; May 23rd. 2nd Lieut. J. I. M. O'Beirne, R. War. R., and to be sec'd.; May 26th. Temp. 2nd Lieut. H. Harris, attd. R. Lanc. R., and to be transfd. to the Gen. List; May 26th. Lieut. K. B. Brigham, R.F.A. (T.F.), and to be sec'd.; June 2nd. Temp. 2nd Lieut. E. C. J. Elliot, Essex R., and to be transfd. to the Gen. List; June 3rd. Temp. 2nd Lieut. L. S. White, Gen. List; June 5th. Lieut. R. W. White, Can. Gen. List; June 5th. Temp. Lieut. H. L. Waite, W. Rid. R., and to be transfd. to the Gen. List; June 6th. Temp. 2nd Lieut. G. M. E. Bayly, Army Cyclists Corps, and to be transfd. to the Gen. List; June 7th. Temp. Lieut. C. A. W. Thompson, R.A., and to be transfd. to the Gen. List; June 10th. 2nd Lieut. E. F. Matthew, R.F.A. (T.F.), and to be sec'd.; June 16th. Capt. T. Gibbons, Ches. R. (T.F.), and to be sec'd.; June 17th. 2nd Lieut. (on prob.) A. Dewar, R.F.A., S.R.; June 17th. Lieut. T. I. L. Lloyd, Mon. R. (T.F.), and to be sec'd.; June 18th. 2nd Lieut. E. V. Maclean, R.F.A. (T.F.), and to be sec'd.; June 19th. 2nd Lieut. W. S. Mansell, E. Surr. R.,

S.R., from R. Suss. R.; June 20th. Temp. 2nd Lieut. E. H. Kann, N. Lan. R., and to be transfd. to the Gen. List; July 1st. 2nd Lieut. W. Helmore, R.A., and to be sec'd.; July 3rd. 2nd Lieut. D. Lindsay, High. Div. Cyc. Co. (T.F.), and to be sec'd.; July 6th. Temp. Lieut. W. C. Foster, Wilts. R., and to be transfd. to the Gen. List; July 8th. Temp. Lieut. C. V. Clayton, Army Cyclist Corps, from L'pool R., and to be transfd. to the Gen. List; July 8th. 2nd Lieut. L. M. Elworthy, Essex R., and to be sec'd.; July 9th. 2nd Lieut. R. St. J. Hartley, Devon. R., and to be sec'd.; July 9th. Lieut. H. M. Yeatman, Wilts. R., S.R.; July 10th. Temp. 2nd Lieut. L. T. Smith, attd. Middx. R., and to be transfd. to the Gen. List; July 10th. 2nd Lieut. (Temp. Lieut.) W. D. Cullen, E. Surr. R. (T.F.), and to be sec'd.; July 10th. 2nd Lieut. (Temp. Lieut.) L. D. Baker, R. Dub. Fus., S.R., and to be sec'd.; July 10th. Temp. 2nd Lieut. H. Simonis, R.A., and to be transfd. to the Gen. List; July 10th. 2nd Lieut. T. S. Pearson, M.C., R.A., and to be sec'd.; July 10th. Lieut. B. Fitz H. Randall, Ind. Cav.; July 11th. 2nd Lieut. C. E. Barrington, R.A., and to be sec'd.; July 11th. 2nd Lieut. E. C. Colman, Wilts. R., S.R., and to be sec'd.; July 11th. Temp. 2nd Lieut. A. N. Donnet, Army Cyclist Corps, from attd. R. War. R., and to be transfd. to the Gen. List; July 12th. 2nd Lieut. K. Norwood, N. Lan. R. (T.F.), and to be sec'd.; July 12th. Temp. Lieut. J. P. Greenwood, A.S.C., and to be transfd. to the Gen. List; July 14th. 2nd Lieut. E. J. H. Douch, R.A., and to be sec'd.; July 14th. Lieut. A. P. McLean, Canadian Inf.; July 17th. Temp. Lieut. R. N. K. Jones, A.S.C., and to be transfd. to the Gen. List; July 24th. Temp. 2nd Lieut. D. L. Reed, Notts. and Derby R.; July 25th. Lieut. A. S. Taylor, Can. Mtd. Rif.; July 26th. Temp. Lieut. V. N. F. Surtees, K.O. Sco. Bord., and to be transfd. to the Gen. List; July 26th. Capt. C. F. Gordon, M.C., N. Staff. R., and to remain sec'd.; July 27th. Temp. 2nd Lieut. (on prob.) J. B. Pirie, A.S.C., and to be transfd. to the Gen. List; July 27th. Temp. 2nd Lieut. C. W. Duffield, Essex R., and to be transfd. to the Gen. List; July 27th. Temp. 2nd Lieut. A. F. Kelly, A.S.C., and to be transfd. to the Gen. List; July 27th. Temp. 2nd Lieut. C. H. Keefe, Army Cyclist Corps, and to be transfd. to the Gen. List; July 28th. Temp. Lieut. J. V. Barry, A.S.C., and to be transfd. to the Gen. List; July 29th. 2nd Lieut. H. S. Royffe, Middx. R. (T.F.), and to be sec'd.; July 31st. Temp. 2nd Lieut. W. A. Taylor, Army Cyc. Corps, from attd. Sco. Rif., and to be transfd. to the Gen. List; July 31st. 2nd Lieut. S. M. Smith, Lond. R. (T.F.), and to be sec'd.; July 31st. 2nd Lieut. W. J. Pierce, L'pool R., S.R., and to be sec'd.; July 31st. Temp. 2nd Lieut. C. H. Graham, High. L.I., and to be transfd. to the Gen. List; July 31st. Lieut. H. C. Waghorn, Lond. R. (T.F.), and to be sec'd.; Aug. 2nd. Temp. Capt. J. F. Davison, Gen. List; Aug. 3rd. Temp. Lieut. T. H. Clarke, Army Ord. Dept., and to be transfd. to the Gen. List; Aug. 3rd. Lieut. C. W. MacAloney, Canadian Inf. Bn.; Aug. 3rd. Temp. 2nd Lieut. H. M. Gibbs, Bedf. R., and to be transfd. to the Gen. List; Aug. 3rd. Temp. 2nd Lieut. W. E. L. Cass, Gen. List; Aug. 3rd. 2nd Lieut. (on prob.) H. Scholtz, R.F.A., Spec. Res.; Sept. 1st, with seniority from Aug. 3rd. Temp. 2nd Lieut. W. M. V. Cotton, Gen. List; Aug. 4th. Temp. 2nd Lieut. A. Kock, Gen. List; Aug. 4th. 2nd Lieut. A. V. Shewell, Glouc. R., and to be sec'd.; Aug. 4th. Temp. Lieut. C. B. Bird, M.C., R.A., and to be transfd. to the Gen. List; Aug. 5th. Temp. Lieut. J. B. C. Madge, R.A., and to be transfd. to the Gen. List; Aug. 5th. Temp. 2nd Lieut. L. M. Maxwell, Essex R., and to be transfd. to the Gen. List; Aug. 5th. 2nd Lieut. G. A. Scutt, Middx. R. (T.F.), and to be sec'd.; Aug. 6th. Lieut. P. R. Cawdell, A.S.C. (T.F.), and to be sec'd.; Aug. 7th. 2nd Lieut. H. G. P. Ovenden, E. Surr. R., and to be sec'd.; Aug. 7th. Temp. 2nd Lieut. (on prob.) M. E. Mealing, Shrops. L.I.; Aug. 7th. Temp. 2nd Lieut. C. F. Drabble, Durh. L.I., and to be transfd. to the Gen. List; Aug. 7th. Temp. 2nd Lieut. S. T. Payne, R.W. Surr. R., and to be transfd. to the Gen. List; Aug. 7th. Temp. 2nd Lieut. A. G. Mortlock, Army Cyclist Corps, and to be transfd. to the Gen. List; Aug. 8th. 2nd Lieut. F. B. O'Dowd, Middx. R., (T.F.), and to be sec'd.; Aug. 9th. Temp. Lieut. E. J. McLoughlin, R. Sussex R., and to be transfd. to the Gen. List; Aug. 10th. Temp. Lieut. G. P. Colin, Gen. List; Aug. 10th. 2nd Lieut. S. H. Griffiths, Ches. R., and to be sec'd.; Aug. 10th. Temp. 2nd Lieut. G. E. Barnett, attd. D. of Corn. L.I., and to be transfd. to the Gen. List; Aug. 10th. Temp. 2nd Lieut. H. V. Northam, Notts. and Derby R., and to be transfd. to the Gen. List; Aug. 13th. Temp. 2nd Lieut. J. T. Gibbon, Gen. List; Aug. 15th. Temp. Lieut. R. Goudie, High. L.I.; Aug. 17th. Temp. Lieut. R. T. Fagan, A.S.C., and to be transfd. to the Gen. List; Aug. 24th. Temp. 2nd Lieut. C. H. Marchant, Gen. List; Aug.

25th. Lieut. A. H. M. Copeland, Canadian A.S.C.; Aug. 26th. 2nd Lieut. (on prob.) E. E. Macartney, R.G.A., S.R.; Aug. 26th. 2nd Lieut. F. A. Prescott, Border R., S.R., and to be sec'd.; Aug. 26th. Temp. 2nd Lieut. R. J. E. P. Goode, R. Ir. Fus., and to be transfd. to the Gen. List; Aug. 26th. 2nd Lieut. F. M. Corry, Notts. and Derby. R. (T.F.), and to be sec'd.; Aug. 26th. 2nd Lieut. G. G. Coury, V.C., S. Lan. R., S.R., from attd. S. Lan. R. (T.F.), and to be sec'd.; Aug. 28th. Temp. 2nd Lieut. C. E. Maslin, Bedf. R., and to be transfd. to the Gen. List; Aug. 28th. Temp. 2nd Lieut. W. T. Jourdan, Gen. List; Aug. 29th. 2nd Lieut. H. J. Davis, Linc. R., S.R., and to be sec'd.; Aug. 29th. Lieut. W. A. Landry, Canadian Art.; Aug. 30th. Temp. 2nd Lieut. J. W. Aldred, R. Lan. R., and to be transfd. to the Gen. List; Aug. 30th. Temp. 2nd Lieut. C. P. Ranger, Lan. Fus.; Sept. 1st. Temp. 2nd Lieut. C. T. Brown, Middx. R., and to be transfd. to the Gen. List; Sept. 1st. Temp. 2nd Lieut. B. Pool, Gen. List; Sept. 1st. Temp. 2nd Lieut. C. P. R. Holdcroft, Gen. List; Sept. 10th. Temp. Lieut. H. G. Collins, A.S.C., and to be transfd. to the Gen. List; Sept. 11th. Temp. 2nd Lieut. A. N. Martyn, Gen. List; Sept. 11th. 2nd Lieut. R. D. W. McKergow, D. Gds., and to be sec'd.; Sept. 13th. 2nd Lieut. W. V. Gray, 4th N. Lan. R. (T.F.), and to be sec'd.; Sept. 14th. Temp. Lieut. L. F. D. Lutyens, R. Fus., and to be transfd. to the Gen. List; Sept. 15th. Temp. 2nd Lieut. R. D. Elliott, Shrops. L.I., and to be transfd. to the Gen. List; Sept. 15th. 2nd Lieut. H. C. Ainger, R. Scots, S.R., and to be sec'd.; Sept. 15th. 2nd Lieut. C. S. T. Lavers, W. York. R., S.R., and to be sec'd.; Sept. 16th. 2nd Lieut. E. W. Monk, Lond. R. (T.F.), and to be sec'd.; Sept. 16th. Lieut. N. L. Sheppard, Canadian Inf. Bn.; Sept. 18th. Lieut. W. O. Boger, Lord Strathcona's Horse, Sept. 18th. 2nd Lieut. P. C. Routley, Welsh R. (T.F.), and to be sec'd.; Sept. 18th. Temp. 2nd Lieut. F. A. Fyfe, M.C., L'pool R., and to be transfd. to the Gen. List; Sept. 19th. Temp. 2nd Lieut. W. W. Fitzgerald, Gen. List; Sept. 19th. Temp. Lieut. A. L. Harrow-Bunn, Notts. and Derby R., and to be transfd. to the Gen. List; Sept. 20th. Temp. 2nd Lieut. F. W. A. Vickery, Dur. L.I.; Sept. 20th. 2nd Lieut. R. M. C. Macfarlane, R.A., and to be sec'd.; Oct. 28th, seniority 21st Sept. Temp. 2nd Lieut. R. Fletcher, Northd. Fus., and to be transfd. to the Gen. List; Nov. 27th, seniority Sept. 21st. Temp. 2nd Lieut. H. C. Barr, Gen. List; Dec. 6th, seniority Sept. 21st. 2nd Lieut. J. N. Wilkinson, E. Lanc. R.E. (T.F.), and to be sec'd.; Nov. 17th, seniority 22nd Sept. Temp. 2nd Lieut. J. R. Orrell, Manch. R., and to be transfd. to the Gen. List; Nov. 16th, seniority Sept. 26th. 2nd Lieut. J. M. R. Miller, K.O. Sco. Bord., S.R., and to be sec'd.; Dec. 3rd, seniority Sept. 26th. Temp. 2nd Lieut. F. M. C. Houghton, Army Cyclist Corps, and to be transfd. to the Gen. List; Dec. 22nd, seniority Sept. 27th. Temp. 2nd Lieut. (on prob.) W. Steer, Gen. List; 15th Nov., seniority Sept. 27th. Temp. Lieut. A. D. Roberts, M.C., Sco. Rif., and to be transfd. to the Gen. List; Nov. 16th, seniority Sept. 28th. Temp. 2nd Lieut. E. F. W. Smith, Leins. R., and to be transfd. to the Gen. List; Nov. 15th, seniority Sept. 28th. 2nd Lieut. (Temp. Lieut.) J. Cullen, Yeo. (T.F.), and to be sec'd.; Nov. 29th, seniority Sept. 29th. Temp. 2nd Lieut. G. R. Thorne, A.S.C., and to be transfd. to the Gen. List; Dec. 2nd, seniority Oct. 2nd. Temp. 2nd Lieut. J. K. Campbell, Gen. List; Dec. 3rd, seniority Oct. 3rd. Temp. 2nd Lieut. J. E. Le Gallais, Gen. List; Jan. 9th, seniority Oct. 3rd. 2nd Lieut. (Temp. Lieut.) E. L. Chadwick, R. War. R. (T.F.), and to be sec'd.; Nov. 16th, seniority Oct. 5th. Temp. 2nd Lieut. W. Harms, Northd. Fus. and to be transfd. to the Gen. List; Dec. 31st, seniority Oct. 5th. Temp. 2nd Lieut. N. M. H. Bernham, Gen. List; Nov. 16th, seniority Oct. 6th. Temp. 2nd Lieut. F. Young, Gen. List; Nov. 18th, seniority Oct. 6th. Temp. 2nd Lieut. H. A. R. Bizion, York. R., and to be transfd. to the Gen. List; Nov. 23rd, seniority Oct. 6th. Lieut. G. J. O. Brichta, Canadian Mtd. Rif.; Nov. 16th, seniority Oct. 7th. Temp. 2nd Lieut. V. C. Manuel, Gen. List; Nov. 15th, seniority Oct. 10th. Temp. 2nd Lieut. C. V. Palmer, attached Norf. R., and to be transfd. to the Gen. List; Dec. 10th, seniority Oct. 10th. 2nd Lieut. H. I. Fordred, Lond. R. (T.F.), and to be sec'd.; Jan. 6th, seniority Oct. 10th. Temp. 2nd Lieut. C. St. C. Acheson, Gen. List; Dec. 28th, seniority Oct. 12th. Temp. 2nd Lieut. A. W. Waddy, Gen. List; Dec. 28th, seniority Oct. 13th. Temp. 2nd Lieut. G. G. Williams, Gen. List; Nov. 15th, seniority Oct. 14th. Temp. 2nd Lieut. A. W. Clarke, Gen. List; Jan. 3rd, seniority Oct. 14th. 2nd Lieut. (Temp. Lieut.) F. Surgey, Div. Cyclist Co. (T.F.), and to be sec'd.; Nov. 15th, seniority Oct. 15th. Temp. Lieut. H. E. Bellamy, Middx. R., and to be transfd. to the Gen. List; Jan. 9th, seniority Oct. 16th. 2nd Lieut. G. C. Gardener, R. Ir. Regt., from Machine Gun Corps, and to

remain sec'd.; Dec. 15th, seniority Oct. 16th. Temp. Lieut. J. A. Ainscow, R. War. R., and to be transfd. to the Gen. List; Dec. 13th, seniority Oct. 17th. Temp. 2nd Lieut. H. S. Elliott, Gen. List; Jan. 6th, seniority Oct. 17th. Temp. Lieut. H. W. Guy, R. Fus., from attached Serv. Battn., R. Fus. and to be transfd. to the Gen. List; Dec. 28th, seniority May 20th. Temp. Lieut. G. H. Walker, 11th S. Lan. R., and to be transfd. to the Gen. List; Oct. 16th, seniority June 17th. Lieut. A. Anderson, Conn. Rang., S.R., and to remain sec'd.; Nov. 2nd, seniority June 20th. 2nd Lieut. (Temp. Lieut.) K. J. B. Munro, Devon R., S.R., and to be sec'd.; Nov. 16th, seniority July 10th. Temp. 2nd Lieut. S. A. Gibbons, Gen. List; Nov. 16th, seniority July 26th. 2nd Lieut. (Temp. Lieut.) A. H. George, Ches. R. (T.F.), and to be sec'd.; Nov. 16th, seniority July 31st. 2nd Lieut. (Temp. Lieut.) F. D. Murphy, Div. Cyclist Cos. (T.F.), and to be sec'd.; Dec. 31st, seniority Aug. 1st. Lieut. W. D. Thomson, Canadian Inf.; Nov. 18th, seniority Aug. 3rd. Temp. 2nd Lieut. H. M. Lett, R. Berks. R., and to be transfd. to the Gen. List; Oct. 6th, seniority Aug. 4th. 2nd Lieut. G. J. Ogg, High. L.I. (T.F.), to be sec'd.; Nov. 1st, seniority Aug. 6th. 2nd Lieut. L. B. Jones, Welsh R. (T.F.), and to be sec'd.; Dec. 31st, seniority Aug. 7th. Temp. Lieut. R. Affleck, A.S.C. and to be transfd. to the Gen. List; Nov. 1st, seniority Aug. 10th. Temp. 2nd Lieut. N. W. Morrison, Gen. List; Dec. 28th, seniority Aug. 10th. Temp. Lieut. E. G. S. Gordon, High. L.I., and to be transfd. to the Gen. List; Jan. 9th, 1917, seniority Aug. 12th. 2nd Lieut. A. Emmerson, Leic. R. (T.F.), and to be sec'd.; Dec. 10th, seniority Aug. 12th. 2nd Lieut. L. B. Potts, M.C., S. Wales Bord. and to be sec'd.; Nov. 11th, seniority Aug. 17th. Temp. 2nd Lieut. G. A. Forrest, A.S.C., and to be transfd. to the Gen. List; Oct. 21st, seniority Aug. 21st. Lieut. F. E. Brown, R. Dub. Fus., S.R., and to be sec'd.; Jan. 4th, seniority Aug. 29th. Temp. 2nd Lieut. W. E. W. Cushing, Norf. R., and to be transfd. to the Gen. List; Dec. 31st, seniority Aug. 29th. Temp. 2nd Lieut. H. W. Soulby, Suff. R., and to be transfd. to the Gen. List; Jan. 2nd, seniority Aug. 30th. 2nd Lieut. H. D. Hewett, E. Kent R., S.R., and to be sec'd.; Dec. 31st, seniority Aug. 31st. 2nd Lieut. A. O. Macniven, High. L.I. (T.F.), and to be sec'd.; Nov. 20th, seniority Sept. 4th. Temp. 2nd Lieut. J. R. Hopkins, R. Scots, and to be transfd. to the Gen. List; Dec. 28th, seniority Sept. 4th. Temp. Lieut. G. P. Morris, Oxf. and Bucks. L.I., and to be transfd. to the Gen. List; Nov. 1st, seniority Sept. 5th. Lieut. (Temp. Capt.) P. E. Welchman, R.E. (T.F.), and to be sec'd.; Nov. 15th, seniority Sept. 6th. 2nd Lieut. (Temp. Lieut.) C. B. M. Dale, Northd. Fus. (T.F.), and to be sec'd.; Dec. 3rd, seniority Sept. 6th. Temp. Lieut. J. R. Wilson, R.E. (T.F.); Dec. 14th, seniority Sept. 6th. Dec. 16th with seniority from the dates shown against their names: Temp. 2nd Lieut. H. Faull, attd. N. Lan. R., and to be transfd. to the Gen. List; Sept. 6th. Temp. 2nd Lieut. C. H. Mather, attd. N. Staff. R., and to be transfd. to the Gen. List; Sept. 6th, 1916. Temp. 2nd Lieut. A. P. Adams, Gen. List; Sept. 6th. 2nd Lieut. F. C. Brooks, R.A., and to be sec'd.; Dec. 17th, seniority Sept. 6th. 2nd Lieut. L. J. Purgold, R.F.A. (T.F.), and to be sec'd.; Dec. 18th, seniority Sept. 6th. 2nd Lieut. E. E. S. Wheatley, R.A. and to be sec'd.; Dec. 19th, seniority Sept. 6th. Temp. 2nd Lieut. J. H. McLennan, Gen. List; Dec. 28th, seniority Sept. 9th. Temp. 2nd Lieut. C. H. P. Ewbank, Gen. List; Nov. 16th, seniority Sept. 11th. 2nd Lieut. A. L. M. Van der Byl, R.F.A., S.R.; Nov. 1st, seniority Sept. 13th. Temp. 2nd Lieut. H. B. Mann, Gen. List; Dec. 28th, seniority Sept. 15th. 2nd Lieut. (Temp. Lieut.) W. R. Adkins, Lond. R. (T.F.), and to be sec'd.; Nov. 1st, seniority Sept. 16th. Temp. 2nd Lieut. W. Hallitt, Northd. Fus., and to be transfd. to the Gen. List; Dec. 28th, seniority Sept. 17th. 2nd Lieut. (Temp. Lieut.) E. D. G. Galley, A.S.C. and to be sec'd.; Nov. 24th, seniority Sept. 18th.

Jan. 9th, with seniority from the dates shown against their names: Temp. 2nd Lieut. H. Brooks, Gen. List; Oct. 17th. Temp. Capt. L. Findlay, attd. High. L.I., and to be transfd. to the Gen. List; Oct. 20th. Lieut. S. C. Tinne, R.W. Kent R., and to be sec'd.; Oct. 20th. Lieut. E. G. F. Thomson, Essex R. (T.F.), and to be sec'd.; Oct. 20th. 2nd Lieut. G. Bryers, N. Lan. R. (T.F.), and to be sec'd.; Oct. 20th. Temp. 2nd Lieut. H. J. H. Dicksee, Gen. List; Nov. 15th, seniority Oct. 21st. Temp. 2nd Lieut. G. Everingham, Gen. List; Dec. 7th, seniority Oct. 21st. 2nd Lieut. G. R. Y. Stout, Argyll and Suthd. Hgts., (T.F.), and to be sec'd.; Jan. 4th, seniority Oct. 21st. 2nd Lieut. J. E. S. P. Bradford, W. Rid. R., from a Balloon Officer; Jan. 9th, seniority Oct. 21st. 2nd Lieut. J. B. Weir, Sea. Hgts. (T.F.), and to be sec'd.; Dec. 28th, seniority Oct. 22nd. Temp. 2nd Lieut. H. G. W. Debenham, Gen. List; Jan. 9th, seniority Oct. 24th. Temp.

2nd Lieut. C. G. Durham, Gen. List; Dec. 16th, seniority Oct. 25th. 2nd Lieut. (Temp. Lieut.) J. T. Quick, Devon R. (T.F.), and to be sec'd.; Jan. 9th, seniority Oct. 26th. Temp. 2nd Lieut. E. R. Stewart, Gen. List; Dec. 28th, seniority Oct. 26th. Lieut. C. B. Catnach, Northd. Fus. (T.F.), and to be sec'd.; Jan. 9th, seniority Oct. 26th. 2nd Lieut. G. Masters, New Zealand Pioneer Bn.; Dec. 28th, seniority Oct. 27th. Temp. 2nd Lieut. A. C. Heaven, Gen. List; Dec. 31st, seniority Oct. 27th. 2nd Lieut. R. Hamilton, High. Cyclist Bn. (T.F.), and to be sec'd.; Jan. 4th, seniority Oct. 27th. Temp. 2nd Lieut. W. Kellett, Som. L.I., and to be transfd. to the Gen. List; Jan. 13th, seniority, Oct. 28th. Temp. 2nd Lieut. H. E. Freeman-Smith, R.E.; Dec. 28th, seniority Oct. 29th. Lieut. C. F. Wolley-Dod, Notts. and Derby. R., and to be sec'd.; Dec. 3rd, seniority Oct. 30th. Temp. Maj. J. A. C. Wright, A.S.C.; Jan. 9th, seniority Oct. 31st. Temp. Lieut. L. H. Jones, York. R., and to be transfd. to the Gen. List; Jan. 9th, seniority Oct. 31st. Temp. 2nd Lieut. T. B. Jones, Gen. List; Dec. 23rd, seniority Nov. 2nd. 2nd Lieut. A. W. Phillips, M.C., R. Fus., S.R., and to be sec'd.; Jan. 6th, seniority Nov. 2nd. Temp. 2nd Lieut. F. C. Coops, L'pool R., and to be transfd. to the Gen. List; Jan. 6th, seniority Nov. 4th. 2nd Lieut. (on prob.) B. J. Venn, R.E.; Dec. 28th, seniority Nov. 5th. Temp. 2nd Lieut. R. Cameron, Gen. List; Dec. 31st, seniority Nov. 10th. Temp. Lieut. G. E. Gibbons, Garr. Bn., N. Staff. R., and to be transfd. to the Gen. List; Jan. 9th, seniority Nov. 15th. Temp. Lieut. E. Burney, M.C., Gen. List; Jan. 13th, seniority Nov. 25th. Lieut. A. R. Leggo, Canadian Gen. List; Dec. 31st, seniority Nov. 29th. Capt. C. Fawcett, R. Suss. R. (T.F.), and to be sec'd.; Jan. 13th, seniority Dec. 4th.

Flying Officers.—Feb. 13th: Temp. Lieut. P. P. C. Penberthy, attd. Shrops. L.I., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) R. N. Swann, Gen. List. Feb. 19th: Temp. Lieut. R. A. Walmisley, Gen. List, from a Flying Officer (Obs.), with seniority from May 30th; 2nd Lieut. W. O. B. Winkler, R.G.A. (T.F.), and to remain sec'd.; 2nd Lieut. K. B. Cooksey, R. W. Kent R., S.R., and to be sec'd. From Flying Officers (Observers): 2nd Lieut. (Temp. Lieut.) H. R. Jaques, S. Staff. R., S.R.; Feb. 18th, with seniority from Dec. 26th, 1915. Feb. 20th: Lieut. J. A. G. Brewis, Durh. L.I., S.R., with seniority from May 1st, 1916; Temp. 2nd Lieut. (Temp. Lieut.) F. Sharpe, Notts. and Derby. R., with seniority from June 3rd; Temp. 2nd Lieut. L. C. Chapman, Gen. List, with seniority from June 3rd.

Equipment Officers, 2nd Class.—2nd Lieut. (Temp. Capt.) J. C. Briggs, Leic. R. (T.F.), from the 3rd Cl.; Jan. 1st.

3rd Class.—Hon. Lieut. L. W. Wethered, T.F. Res., and to be transfd. to Gen. List; Feb. 8th. Temp. 2nd Lieut. J. A. Woods, Gen. List; Feb. 15th. Feb. 20th: 2nd Lieut. (on prob.) A. S. Windsor, S.R.; 2nd Lieut. B. C. Adamson, S.R.; 2nd Lieut. E. Dodson, S.R.; Feb. 23rd.

Supplementary to Regular Corps.—2nd Lieut. H. P. Tempest relinquishes his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut; March 10th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. Dodson, A. J. J. Lamb. The under-mentioned to be 2nd Lieuts. (on prob.): J. F. Bargman; Feb. 9th. W. T. Hanson; Feb. 12th.

London Gazette Supplement, March 10th.

Park Commander.—The appointment of Capt. (Temp. Maj.) F. L. Scholte, S.R., notified in the *Gazette* of Jan. 19th., is post-dated to Nov. 10th.

Equipment Officers, 1st Class.—From Staff Lieuts., Dec. 14th, 1916: Temp. Capt. R. A. Coote, Gen. List; 2nd Lieut. T. Goulburn, S.R., and to be Temp. Capt. whilst so employed.

2nd Class.—Dec. 14th: 2nd Lieut. R. W. Billingham, S.R., from a Staff Lieut., and to be Temp. Lieut. whilst so employed. From the 3rd Class., and to be Temp. Lieuts. whilst so employed:—2nd Lieuts. S.R.: A. C. Hartley, L. B. W. Jolley, T. C. Thrupp, J. M. Heesem, J. D. Coales, T. Jones, R. G. Booth, E. W. Walford, C. H. Drabble, F. E. Pike, A. L. Butcher, A. O. Betts; Capt. J. W. G. Mackinlay, S.R., from the 3rd Class; Capt. R. W. Thomas, Lond. R. (T.F.); Temp. Lieut. J. Jensen, Gen. List; Temp. Lieut. C. H. T. Alston, High. L.I., and to be transfd. to Gen. List. Temp. Lieut. H. Atkins, A. Ord. Dept., and to be transfd. to Gen. List. Jan. 1st. 2nd Lieut. (Temp. Lieut.) S. J. Waters, R.F.C. (T.F.), and to be sec'd.; Jan. 26th.

3rd Class.—Temp. 2nd Lieut. W. G. M. Nicholl, Gen. List; April 17th. (Substituted for the notification in the *Gazette* of May 4th). 2nd Lieut. F. J. Collet, R.E. (T.F.); Dec. 14th. Lieut. T. G. Skeats, R. Fus., S.R.; Jan. 1st.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) W. Simmonds relinquishes his commission on account of physical unfitness as a Pilot or Observer; March 11th.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

Admiralty, March 6th.
"On March 4th a raid was carried out by naval aeroplanes on the blast furnaces at Brebach. A large number of heavy bombs were dropped. All our machines and pilots returned safely."

War Office, March 6th.
"Egypt.—On March 6th our aircraft carried out a series of bombing attacks on enemy troops, railways trains, rolling-stock and permanent ways. About a ton of high explosive was dropped, and much damage caused to personnel and material."

General Headquarters, March 7th.
"On the 6th there was considerable aerial activity, and a great deal of successful reconnaissance, photography and artillery work was done by our machines, and valuable information was obtained. Many bombs were dropped on the enemy's billets and dumps."

"The enemy made a determined but unsuccessful effort to stop our work, sending up a very large number of machines. Much aerial fighting took place all along the Front throughout the day, during which three hostile machines were brought down and at least three others driven down damaged. Four of our machines were brought down, and seven others are missing."

General Headquarters, March 10th.
"Yesterday an aerial patrol of our machines was heavily engaged by a strong hostile formation. During the day four of our aeroplanes failed to return; one of the enemy's machines is known to have been brought down."

General Headquarters, March 12th.
"There was considerable activity yesterday and much successful bombing and reconnaissance work was carried out by our aeroplanes. Air fighting was continuous. Nine enemy machines were brought down or driven down damaged, four of which are known to have been destroyed. Five of our machines are missing."

French.

Paris, March 6th.
"It is confirmed that one of our pilots brought down a German machine on March 4th in the region of Ornes."

"During the daytime of March 4th a group of machines of the British Naval Air Service bombarded the railway stations of Brebach and of St. Avold (south-west of Saarbrück). Forty bombs were dropped, and most of them struck the objective aimed at."

"On the night of March 4th-5th the French airmen dropped bombs on the railway station and military establishments of Freiburg-in-Brisgau and on the mills at Kehl, near Strassbourg."

"Last night a French air squadron dropped over 3 tons of bombs on the aerodrome of Varennes (Oise), the sheds of which sustained serious damage."

Paris, March 7th.
"On March 4th Warrant Officer Casale brought down his sixth German aeroplane. The machine came crashing to the ground in the region of Dippe. Yesterday one of our pilots attacked at close quarters a Rumpler aeroplane, and brought it down in our lines north of Laval."

"The Rumpler which fell yesterday in our lines to the north of Laval was brought down by Lieut. Piusard. This is the fifth enemy aeroplane for which the pilot has accounted."

Paris, March 11th.
"It is confirmed that a German aeroplane was brought down in an aerial fight on March 4th. The enemy machine fell in the neighbourhood of Roye."

"Last night a German aeroplane threw bombs on Belfort, but caused neither casualties nor damage."

Russian.

Petrograd, March 6th.
"On March 4th one of our airships, notwithstanding the attacks by German battleplanes, made a flight over Baranovitchi, dropping some bombs. In the neighbourhood of Volchek Station (Sarny-Kovel railway) a German aeroplane was brought down by Aviator Sub-Lieut. Andreev. The enemy machine caught fire, and the aviators were taken prisoners."

Petrograd, March 9th.
"A squadron of our aeroplanes made a flight over the station of Soly (west of Smorgon), dropping some bombs."

Petrograd, March 12th.
"In the Riga region the airman, Non-Commissioned Officer Maklapu, brought down a German aeroplane and took the occupants, who were wounded, prisoners."

Italian.

Rome, February 27th.
"Enemy aviators dropped bombs on Vallone (Carso). A few persons were injured."

Rome, February 28th.
"Enemy aeroplanes dropped some bombs, without any result, on Gorizia and on the Vallone. One of our air squadrons successfully bombarded the enemy's billeting areas in the neighbourhood of Serrada, on the Folgaria plateau (Upper Astico)."

Rome, March 1st.
"Enemy aeroplanes dropped some bombs on Gorizia; four men were wounded. Several other raids were repulsed by our chasers. Two hostile aeroplanes were hit by the fire of our anti-aircraft batteries. One was brought down in the neighbourhood of Boscomalo (Carso), the other fell north of Duino (Gulf of Trieste)."

Rome, March 2nd.
"Enemy aeroplanes dropped bombs on Gorizia and in the Vallone. No damage was done. Our aeroplanes successfully bombarded the enemy's line of communication."

Rome, March 3rd.
"Some of our aeroplanes dropped bombs on the enemy's rear lines on the Carso."

Rome, March 11th.
"The weather being favourable there was considerable aircraft activity, and aerial bombardments took place on both sides. We suffered no damage."

"During the evening some of our aeroplanes dropped bombs on the valley of Muggia (south of Trieste) and on the dockyards at San Rocco (west of Muggia) and Santa Sabba, on the Bay of Muggia. Conflagrations were observed at various places."

Roumanian.

Jassy, February 28th.
"Two enemy aeroplanes which were manoeuvring above our positions in the region of Racosa [on the Susitza] were driven off by our aeroplanes after a short engagement."

German.

Berlin, March 5th.
"During very numerous aerial engagements our enemies yesterday lost eighteen aeroplanes, one of them being shot down from the ground. Our losses amount to four machines."

Berlin, March 7th.
"Clear weather favoured the airmen in the execution of their tasks. During numerous aerial engagements 15 enemy aeroplanes were shot down. We lost one machine by the action of the enemy."

Berlin, March 8th.
"Between Vileyka and Molodeczno a Russian train was derailed by the dropping of bombs."

Berlin, March 9th.
"During the month of February we lost 24 aeroplanes. Our enemies in the West, the East and in the Balkans lost 91 machines, of which 37 are in our possession. Forty-nine were seen to fall behind the enemy's lines, and five machines were forced to land."

Berlin, March 10th.
"Our airmen shot down six enemy aeroplanes and two captive balloons. The fire of our anti-aircraft guns brought down an enemy airman. Lieut. von Richthofen scored his twenty-fifth success in air fighting."

Berlin, March 12th.
"Western Front.—A very clear atmosphere was responsible for increased activity on the part of the long-range artillery and the aviators in many sectors of the Front."

"Owing to aerial attacks by our aviators, the enemy lost 16 aeroplanes and two captive balloons. One aeroplane was brought down by the fire of our anti-aircraft guns."

Austrian.

Vienna, March 10th.
"Near Gorizia a Caproni aeroplane was shot down by our artillery and fell near St. Andrea."

Vienna, March 12th.
"Our airmen bombed a camp near Pesma."

Bulgarian.

Sofia, February 26th.
"Lively aerial activity in the valley of the Vardar and on the Orfano coast. A French aeroplane was brought down in an air fight south of Ghevgheli."

Turkish.

Constantinople, March 12th.
"Sinai Front.—A British aeroplane was brought down, and the observer, an Australian officer, taken prisoner. The machine, which was but slightly damaged, is in our possession."

AVIATION IN PARLIAMENT.

Canadian Officers in the R.F.C.

MR. JOYNSON-HICKS, in the House of Commons on March 7th, asked the Under-Secretary of State for War whether any arrangement has now been arrived at between the Canadian authorities and the Army Council whereby officers of the Canadian forces attached to the Royal Flying Corps will in that capacity receive promotion; and how many Canadian officers there are still attached to the Royal Flying Corps whose promotion has been blocked?

MR. MACPHERSON: Officers of the Canadian forces employed with the Royal Flying Corps are promoted in that corps on the same conditions as any other officer. The question of promotion in their permanent unit is one for the Canadian Government, and I have no knowledge as to the procedure followed.

MR. JOYNSON-HICKS asked whether any arrangement has yet been arrived at between the Canadian Government and the Army Council in reference to the flying pay of Canadian officers attached to the Royal Flying Corps; and, if so, whether he is able to state that the injustice from which such Canadian officers suffered has been remedied?

MR. FORSTER: I understand that the Canadian Government has now authorised revised rates of pay which bring the emoluments of Canadian officers more or less into line with British rates.

The Disposal of Obsolete Machines.

MR. PEMBERTON BILLING asked the Under-Secretary of State for War, whether it is still the practice, where aeroplanes ordered in large quantities have been found unsuitable before delivery is completed, to accept delivery of the balance, and, although insisting upon acceptance test taking place, to remove the engines and burn the aeroplane immediately after such acceptance; and whether he will consider the advisability, where machines have proved inefficient, of cancelling the order for those still undelivered?

The Parliamentary Secretary to the Air Ministry (Major Baird): It has never been the practice to burn aeroplanes immediately after acceptance when they have become obsolete, although it would be desirable on other grounds to dispose of them in that manner. It may, however, become necessary owing to shortage of storage accommodation to take this course before long in respect of certain machines, including some known colloquially as the "P.B. Scout." All contracts for machines which may become obsolete or have turned out to be unsuitable for active service or for instructional purposes are cancelled as soon as this can be done without injustice to the manufacturers.

MR. BILLING: May I ask the hon. member whether he is aware that at the present minute orders are being placed for machines which are known as obsolete, and that at the present minute, even as we are sitting here, brand new machines are having their engines removed and are being burned, and that more of that type are being made by the same firms to complete their contracts; and will he say whether it is the intention of the Government to cancel these contracts and compensate the contractors who are delivering known obsolete machines, thereby saving labour, if not the money that is being squandered on them?

MR. SPEAKER: That is the same question expanded.

Aeroplane Fights on the Western Front.

SIR H. DALZIEL asked the Under-Secretary of State for War whether the Government accept the accuracy of the statement in the German wireless that 18 of our aeroplanes were brought down in one day on the Western Front?

MR. MACPHERSON: The Government does not accept the accuracy of this or any statement in the German wireless *communiqués*, nor as a matter of general policy are corrections made of misstatements in these *communiqués*, since obviously this would encourage the enemy to make false statements in order to elicit the truth. In the case in question the German wireless stated that the enemy lost 18 aeroplanes on March 4th, referring apparently to the whole of the Western Front, and not merely to the British Front.

SIR H. DALZIEL: Can my hon. friend assure us that we still maintain the mastery of the air on the Western Front?

MR. MACPHERSON: I think I can make that assurance.

SIR HENRY DALZIEL on March 13th asked the Under-Secretary of State for War whether he is able to give the House the evidence on which his statement that we still maintain the mastery of the air on the Western Front is based; whether he can state the average number of casualties per week during the last six weeks; and can he also state whether the War Office are in every respect satisfied with the machine that is at present being employed?

MR. MACPHERSON: I will reply to the last two parts of my

right hon. friend's question first. The average casualties per week for the last six weeks are: Killed, 7·6; wounded, 8·3; missing, 4·2.

The War Office is satisfied for the moment with the best types which are being employed. But there are machines still in use, of types which are not up to the latest standard. These are being replaced as rapidly as possible.

As regards the first and main part of the question, the situation in the air on the British front in France at the present moment is undecided. During the winter months, when flying is much interfered with by short days and bad weather, all the belligerents have endeavoured to increase and improve their Air Services. With the advent of good weather, we must expect a severe contest before achieving such a definite superiority as will enable us to throw the enemy entirely on the defensive. In one respect we have been superior to the Germans throughout the war, and that is in the amount of work performed by the Flying Corps for the Army. The Germans have never been able either to carry out such work on a comparable scale, or to stop our men from doing it.

The situation is very similar to that which obtained at the same period of last year. At that time the Germans, reinforced and rested after the winter, put up a serious opposition, and it was only after severe fighting in the air—both at Verdun and in front of our lines—that fighting superiority was established. Even then, this superiority was only maintained by hard and continuous fighting at considerable distances behind the German lines, by which means it was found possible to keep the air above the battlefield practically clear of the enemy. At the opening of last year's campaign, the main concentration of the German air forces was towards Verdun. This year it appears to be in front of the British Forces, a move which probably is connected with the German retirement.

There has not at any time, on any side, in the Western theatre, been a situation which could properly be described as the "mastery" or "supremacy" of the air, and when I replied to a sudden supplementary on this difficult point last week, I hope that the House will realise that I had no wish either to overstate or understate the actual situation. Reinforcements and replacements of material are now being despatched continuously to our front, and there is every reason to hope that we shall assert our superiority in the air this year, as we did last. But, as I have already stated, we must be prepared for severe fighting before that end is achieved.

SIR H. DALZIEL: Would it be in the public interest to state what portion of these machines described as not up to the standard are in use?

MR. MACPHERSON: I am afraid I must have notice of that question.

MR. PEMBERTON BILLING: On what does the hon. gentleman base his proportion of 7 per cent.? Is that on the total of fighting machines, or the total number of men and machines in this country and abroad?

MR. MACPHERSON: I cannot say that. I must confess these figures were supplied to me.

MAJOR HUNT: Is the output of fighting and scouting aeroplanes now used by the British equal to that of the Germans, in view of the fact that about the middle of October it was not? Have you caught up with them yet?

MR. MACPHERSON: I cannot assent to the statement which the hon. and gallant gentleman has made. I am sure the House will realise that I cannot answer off-hand any question of that sort.

MR. FABER: Is the inference from what the hon. gentleman has said that during the past winter and also the winter previous the German activity in the manufacture of aeroplanes has been greater than our own?

MR. MACPHERSON: No, I do not think it has.

MR. BILLING: Is the hon. gentleman aware that these very machines that he says are not fit to keep our end up in France are at present being ordered in large quantities in this country?

MR. SPEAKER: The hon. member should give notice of that question.

MR. BILLING: I will raise the whole question of the Air Service on the Adjournment to-night.

Cerebral Meningitis at R.F.C. School.

CAPT. D. HALL, on March 12th, asked the Under-Secretary of State for War if his attention has been drawn to the outbreak of cerebral meningitis at the jam factory, Coley, near Reading, at present occupied by the School of Technical Training, Royal Flying Corps; if several men there have died of this complaint; if the other men were allowed to be in contact with possible infection without the slightest pre-

caution being taken; if he is aware that at the Coroner's inquest held on February 23rd on one of the victims it was ascertained that the man who died was ill 24 hours before a doctor was summoned, and that the jury and two doctors agreed that medical aid ought to have been obtained sooner; if his attention has been drawn to the character of the answers given by the military authorities to questions asked them by the jury; if his attention has been drawn to the verdict of the Coroner's jury at the enquiry held and to the remarks they added; if any enquiry has been instituted by the War Office; and, if so, what conclusion they have arrived at and what action it is proposed to take?

Mr. Macpherson: Enquiries are being made, and my hon. and gallant friend will be informed of the result.

Promotion in the Air Services.

MR. PEMBERTON BILLING asked the Under-Secretary of State for War whether, in view of the amalgamation of the Royal Naval Air Service and the Royal Flying Corps under the Air Board, he will consider the advisability of reviewing the respective seniority of the officers of those two services so as to remove, if possible, the sense of injustice which has been aroused by the previous slow promotion in the naval wing and the rapid promotion in the military wing?

Mr. Macpherson: My hon. friend is under a misapprehension in thinking that the Royal Naval Air Service and Royal Flying Corps have been amalgamated. The point suggested in his question does not, therefore, arise.

Aeroplanes and Seaplanes Deleted.

MR. PEMBERTON BILLING asked how many aeroplanes and seaplanes have been deleted from the Royal Naval Air Service, and how many aeroplanes have been deleted from the Royal Flying Corps, respectively, within the last twelve months?

Major Baird: I regret that I cannot supply these figures, the publication of which might assist the enemy in calculating the actual strength of our air services in the field.

Sopwith Triplane Scout.

MR. PEMBERTON BILLING asked the Under-Secretary of State for War if he will give the date on which the first Sopwith triplane scout was offered to the authorities; the date on which the first order was placed for the same; what proportion of this order has been delivered; and what proportion is now on active service?

SIDE-WINDS.

AN important announcement by the Ministry of Munitions regarding aluminium scrap and swarf appears on another page, and a careful study of the various clauses should enable many firms using aluminium to materially assist the authorities in connection with supplies of this material.



An Example of the A.C. Car for Flying Officers.—A snap on the stretch of road near Kingston, where a 12-mile speed limit exists.

Major Baird: It would not be in the public interest to give the particulars asked for in this question.

Designs of Service Aeroplanes.

MR. PEMBERTON BILLING asked who is responsible for deciding designs, type and factors of safety for the Royal Naval Air Service aeroplanes operating with our Army in France; who is responsible for deciding the design, type and factors of safety of the Royal Flying Corps' aeroplanes operating with our Army in France; are these requirements identical; and, if not, why not?

Major Baird: The responsibility for the design of aeroplanes for the use of the Royal Naval Air Service and the Royal Flying Corps, which was formerly vested in the Director of Air Services and the Director-General of Military Aeronautics respectively, is now vested in the Air Board for both services. The requirements of the Royal Naval Air Service and the Royal Flying Corps are not necessarily the same.

Friction in the Air Services.

MR. PEMBERTON BILLING, speaking on the motion for the Adjournment, said: I take this, the first opportunity, to call attention to a subject I have purposely allowed to drop for some months. Directly the Air Board was appointed I, in common with several other critics of the air administration in this House, decided to allow them at least to have an opportunity of settling down and seeing if there was any likelihood of the friction and intrigue which had occasioned the trouble and the delay both in the production and in the efficiency of the administration disappearing. It is quite a number of months since that has happened, and subsequent to the last agitation in favour of a more efficient Air Service we did for a short time gain the supremacy of the air on the Western Front. To-day that is not so, and I do not think that any man who has identified himself, as I have done, with the question of the Air Service of our country, should refrain from rising now and calling the attention of the House to that question. The friction between the two services is as great to-day, and is more serious, because it is more suppressed, than it was twelve months ago.

[Notice taken that forty members were not present; House counted, and forty members not being present, the House was adjourned at six minutes after eleven o'clock.]

AUTO-CARRIERS (1912), LTD., are, of course, like most other live concerns, a Government-controlled establishment at the present moment, and are not for the moment engaged in the manufacture of their serviceable and shapely little cars, but on "something" of more immediate importance to the Empire. Nevertheless, like many others in the same industry and condition, they have a waiting list, which, growing daily, proves by the inclusion of the names of flying officers how much this car is appreciated in the services.

It will be remembered how, along about 1912, when aviation as a special arm of our Forces was beginning to make headway, many officers were to be seen driving one of the company's three-wheel sociables, and with the advent of the light car proper the company consolidated their position as the makers of the car most suitable to the requirements of those needing an easy and speedy method of getting to and from the various aerodromes and places of aerial activity.

Other cars there are naturally that are capable of performing the same conditions, but somehow, as happens in these things, certain firms appear to place on the market just the ideal combination required for a certain purpose by certain people, and the "A.C." firm have certainly come to be looked upon as the firm which fills the bill for aviation officers, and right well do they deserve the position they have created by their industry and foresight. Those officers who are wanting a car, although they will of necessity have to bide a wee, would do well to enter their names as early as possible. *Verb. sap.*

THE idea that things glued together are bad is the impression of the lay mind only, the professional knows that a properly made glued joint is stronger than the wood itself. That the joints made in aeroplane construction are good goes without saying, but it is highly necessary that the glue used for this special work is the very best obtainable. That this is appreciated is obvious from the fact that so much attention has been given to this side of the problem by glue specialists. Messrs. Alfred Adams and Co., Ltd., of Reliance Works, West Bromwich, have made a special study of the glues necessary in aeroplane construction, and sub-

mitted them to every possible test under the A.I.D., with the result that their products may be relied upon as being exactly what they are needed to be, each in its own class—the glue for airscrews, and the glue for such work as struts, booms and skids. A letter to the firm will bring full particulars, and possibly something especially suitable to the individual requirements of the enquirer.

Such an important item as glue, which varies with different makers, is, needless to say, a thing that will always repay a little investigation and experiment.

A CALL the other day at 52, High Street, Oxford Street, discovered Mr. Moss, cheery as ever, and doing his best to supply customers with all the wire ferrules and thimbles and a hundred-and-one other things they required, and keep his stock up at the same time—a thing not so easy in these times. Nevertheless, he found time in between attending to sundry urgent calls for a ten minutes chat over old times and new happenings. What a rare tonic is an interlude with this big optimist. His 'phone number is Gerrard 6731, but the tonic cannot be absorbed that way. Try it in the flesh by giving him a personal call.

OMNIUM CENTRAL have now removed from their old offices at 175, Shaftesbury Avenue, to new ones at 29, Red Lion Square, where business is going on as briskly as usual, and to which address all communications should be sent. The new telephone number of the firm is Holborn 185, and the telegraphic code-word "Omniumcentum."

MESSRS. MANN, EGERTON AND CO., LTD., did splendidly in connection with the War Loan, the individual and collective contributions by the directors, staff and employees at Norwich, Ipswich, Bury St. Edmunds and London amounting to no less than £30,000 of new money.

A SLIGHT change in connection with the Midland Presswork Co., of Far Gosford Street, Coventry. As from January 31st the partnership has been dissolved by mutual consent, so far as Mr. Thomas Evans is concerned. The business will be carried on under the same style by the other partners, Messrs. John Harvey, J. B. Harvey, W. H. Harvey and G. E. Matthews, who will receive all accounts and discharge all debts owing by the firm.

FROM MODELS TO FIGHTING MACHINES.

EIGHT or ten years ago a brilliant young sculptor and artist in the quietude of his own study devoted many hours of his over-full time to the design and building of model aeroplanes—little machines which flew. The fascination of the pastime was not appreciated by his friends, but that bothered the sculptor never a whit. Then the dawn of flying broke, and the modeller's thoughts turned to the real thing with longing. With the outbreak of war his ambition was achieved, and a full-sized aeroplane was worked out and built. As a natural outcome of this success, for the time the surroundings of the studio lost most of their attraction, and with the opportunity opening out of a chance to serve the nation came the decision to enter in earnest the ranks of aeroplane constructors. That young sculptor was R. F. Wells, who from such a beginning in the early part of 1915 has since so forged ahead—under the title of the Wells Aviation Co., Ltd.—at such a pace, that the only limit to the capabilities of the firm turning out more and more fighting machines—which are so urgently needed for the Front—is the capacity of the works, and the further call of a certain amount of necessary capital. Primarily the idea was a patriotic desire to help fill the Nation's dire requirements, but in spite of this very considerable profits have resulted, although these it has been necessary to invest in tangible assets, to provide for the continuous and insistent expansion, due to the call of the Government for ever increasing output.

It is a remarkable monument to individual perseverance and efficiency which the Wells Co. have erected down Chelsea way, and incidentally to the benefit of Chelsea. Take merely one of the many sections of the works, which comprise shops capable of dealing with every item of aeroplane construction from the raw material to the finality of the complete machine. This section, covering about 1½ acres, four months ago was waste land. Now it is in full power, helping to turn out some of the latest and best machines flying at the Front, whilst the buildings have been designed and constructed by the Wells Co. as a side line. And this is but an item in the whole concern. The other day, when we had run through the various departments under the very enthu-

By a slip the name of the makers of the "Triumph" Dope Brush was given in their advertisement last week as Hall & Co., Ltd., whereas it should have been John Hall & Sons, Ltd., the name which is so well known in connection with "Broadmead" paints and other specialities. A personal inspection of the dope brush inclines one to think that when Messrs. John Hall & Sons, Ltd., advertise it as "Here's the Dope Brush," their statement is the correct one. It is hardly necessary to lay before aeroplane constructors an indictment of the crimes dope brushes are heir to, they may be summed up in one statement; the bristles come out. This is from no fault of the brush, as a brush for ordinary use, but from the fact that the fixing cement in the stock and the tin binding are affected by the acid constituents of the dope. In the Hall Brush, the cement is acid proof, and the usual tin binding with its riveted joint is replaced by a sheath of solid aluminium without joint. An additional advantage is the finger groove which, although in the picture it does not appear to stand for much, impresses itself on one the moment the brush is taken in the hand. There is a delightful feeling of comfort, and one of power and control directly the fingers drop into the groove on one side and the thumb into that on the other.

Messrs. John Hall & Sons are, of course, known throughout the length and breadth of the land in connection with paints, varnishes, and such things for carriage and motor car builders, and are always ready to carry out experiments in the direction of supplying any new requirement: a case in point:—

Manufacturers of aero engines have always been troubled in that they could not find a satisfactory paint with which to paint their engines. The great difficulty arises from the castor oil which is used on engines before they are painted, which prevents the paint drying. To overcome this difficulty Messrs. John Hall & Sons have produced "Paximento." The method of applying is: One coat of Paximento, which takes four hours to dry; first finishing coat of Castro Register Paint, which takes one hour to dry; then a finishing coat of Castro Register, with a few hours to dry.

The Aeronautical Inspection Department have made a severe test of Paximento, and report that it was unaffected in all tests with petrol and oil until immersed in a bath of castor oil at 240 C., at which some blistering occurred. The test was a very severe one, and the result entirely satisfactory. Here, then, the lead of the dope brush might well be followed with "Here's the Paint."

siastic guidance of Mr. Wells, it was almost with a feeling of bewilderment that we emerged in some totally different district to that in which we started our rounds. Throughout the tour of the different shops the music of the hundreds of machine tools, the drone in the woodworking department, and the varying notes attaching to the many other shops, with the big doping shops as a quiet relief from the otherwise universal din, left little opening for continuous converse. But at every point the hum of work in progress told its own tale, and it was a satisfaction to think that all this toiling was for the direct and immediate good of our fighting forces and for the help of the Empire as a whole.

In the timber yard are ranged stacks of ash, and of a quality to demand the admiration of an expert, running into many thousands of pounds' value in the rough. This item is but another instance of the foresight of Mr. Wells, who gauged the demand for this wood, and now the result is seen in this probably unexampled matured stock, which, for aeroplane purposes, is probably beyond valuing in mere £ s. d. Hard by is a saw-pit, where the first division takes place; and from there the planks pass through the various shops until they take their place in the roofs in the form of various complete parts for which they were designed, ready in their temporary resting place to be drawn upon for assembly in the main erecting shop, and so away to the flying ground for final testing. Throughout the works there is evidence of a splendid margin of stock, giving promise of completed machines by the score. It is well that this is so, for the firm have in hand for the Government orders for complete machines which will help considerably to reduce the margin of "spares." The remunerative prospects of such a business are almost without limit, but in this direction the whole thing is naturally a matter of capital, as limits of expansion must necessarily be reached when the weekly outgoings begin to overlap the immediate returns for "work accomplished." Such is the Wells combination at Chelsea, with its 1,600 employees, which, originating in model making, commenced by sub-contracting for parts in quantity for such machines as the DH¹ and DH², has now attained the proud position of undertaking the entire machines from A to Z.

As a further feeder of profitable work, the company has now in full going order a factory at Chichester, to which is attached a 200-acre aerodrome, where the same live tactics as at Chelsea are in active operation. The aerodrome was only got going on Monday last, yet at midday half-a-dozen pupils arrived at the school, and before evening every one of those men had been put through lessons by Mr. Virgilio, under whose hands so many good men have passed, in particular Capt. Ball, whose flying work has of late been so much to the fore.

Altogether the all too short hour or more which we this week spent in the company of Mr. Wells in the midst of his world was a revelation of one of the many many changes for which the great world upheaval is responsible. It gives a vivid idea of what aviation is going to mean to this universe of ours after Peace has broken out once again. It is establishments like the Wells Co. that should be generously supported, putting for the moment aside the commercially valuable aspect of such an undertaking. We offer our congratulation to the Wells directors, although we hardly envy them their many worries, which must arise continually in the conduct of the series of shops which go to make up the whole organisation.

"WOLSELEY" AERO ENGINE MANUAL.

UNDER the above title Wolseley Motors, Ltd., have issued a most interesting and informative booklet dealing with the different types of "Wolseley-Renault" aero engines. The four types included in the manual are "W.B.," "W.C.," "W.X." and "W.S.," and a description, applying in the main to all four types, is given. The value of the book is further increased by the fact that the same description may be taken to apply to the French Renault engines also, as the differences between the two makes are but small, such as do exist being referred to in another part of the book. In addition to the general description of the engines, there are chapters on the lubricating system, the ignition system, including detailed reference to sparking plugs and magnetos, carburation, dismantling and assembly, timing and testing. Valuable hints are given as to where to look for running defects and how to remedy them, and the book, which is very fully illustrated by photographs and diagrams, cannot fail to be of the greatest assistance to all interested in the care and maintenance of "Wolseley-Renault" aero engines. As a production, it is in the best Wolseley style. Copies may be obtained from the offices of "FLIGHT," the price being 5s. post free.

An Opportunity for Women Workers.

CLASSES for women between the ages of 18 to 35 in light woodwork for aeroplane components are being held at the Willesden Polytechnic, Priory Park Road, Kilburn, N.W., by the Ministry of Munitions. One month's training free, with 12s. per week maintenance allowance. Applications should be made to the secretary.

Fatal Accidents.

AN accident in Warwickshire on March 13th resulted in the deaths of Lieut. Stroff and 2nd Air-Mech. Giles. When their aeroplane was at a height of 200 ft. something went wrong, and the machine dived to earth. Both men were killed instantly. The machine afterwards took fire, and was partly destroyed.

While flying at Hounslow on Sunday morning an accident occurred to a machine, and the pilot, Lieut. H. L. Lascelles, was killed.

Italy and the "U" Boats.

IN the course of a speech in the Chamber as to the measures which are being taken to combat U-boats Admiral Corsi, Minister of Marine, said that the measures already adopted are to be further improved by the employment of numerous aeroplane squadrons and small airships.

Well-known German Pilot Killed.

A REPORT from Germany states that Hans Vollmöller, the well-known German pilot and author, who visited this country just previous to the outbreak of war, died last week from injuries received while testing a new machine.

PUBLICATIONS RECEIVED.

The "Wolseley" Instruction Manual for Aero Engines. Birmingham: Wolseley Motors, Ltd. (Proprietors: Vickers, Ltd.), Adderley Park. Price 5s.

Naval War Services of Officers of the R.N., R.N.R., R.N.A.S., R.N.V.R., M.R. London: Office of "The Royal Navy List," 326, High Holborn. Price 1s. 6d. net.

The Story of the Aeroplane. The Wright-Martin Aircraft Corporation, 60, Broadway, New York, U.S.A.

The Status of Aviation in the United States. Statements of C. D. Walcott and H. D. Souther. Washington, D.C., U.S.A.: Smithsonian Institution.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park and District (66, SOUTH VIEW RD., HORNSEY).

Monthly Report.—Much good work has been done during the past month by the various members, and flying has taken place on Parliament Hill on every Saturday afternoon. Feb. 10th was rather windy, and only three machines were out, "piloted" respectively by Messrs. A. Richards, E. Coleman and R. E. Stansell. The 17th was an eventful day. Early in the afternoon a B.E. biplane circled the flying ground a few times at a height of only about 250 ft., the pilot waving his hands to the members with their models. Also, a collision occurred between the models belonging to Messrs. F. E. Rayner and E. Coleman whilst flying at a good height. Mr. Rayner's dived nose first to the ground, but Mr. Coleman's dived and "picked up" again when within a few feet of the ground, afterwards making a long flight. Some of the best flights of the afternoon were made by Mr. C. J. Burchell's 4-ft. span model, which, on every occasion, rose to a high altitude and flew about 300 yards. Some very graceful banked turns were made by Mr. A. Richards' model, which was fitted with a plane of very high aspect ratio. Two juniors, viz., C. Burchell and R. E. Stansell, were flying models with varying success. On the 24th the same members were out with the exception of Mr. Burchell, sen. Some very fine flights were made by Mr. Rayner's model, which had been considerably lightened. On all occasions it rose steadily to a great height, and made a flight of about 400 yards at a speed of approximately 20 miles per hour. Mr. Richards was at work with one of Mr. Coleman's old machines, and with this he did some fine flying. It "shot up" like a rocket to a height of 150 ft., afterwards making a long flight terminating with a glide. R. E. Stansell, the youngest member of the club, was flying a 3-ft. model very creditably. March 3rd was a very successful day. Some extraordinary flying was done by Mr. E. Coleman's model. It was one of his old machines renovated. All thread bindings were substituted by aluminium clips, which gave the model a very smart and workmanlike appearance. His patience was rewarded, for it made some most extraordinary flights. It rose in spirals to about 200 ft., flew for a distance of from 200 to 300 yds., terminating its flight with a long flat glide to earth with propeller stationary. Mr. Richards was flying a new model, which behaved very similarly to Mr. Coleman's, but did not "get up" to quite such a great height. The machine which Mr. Rayner was flying was suffering from a rather unusual defect. Owing to age and constant use, the fabric of the plane had become deteriorated, with the result that it was not airproof, thus depriving the machine of a lot of its lift. The consequence was that the machine was unable to keep up for any length of time. Messrs. C. J. Burchell and R. E. Stansell were both flying models with good results.

NEW COMPANY REGISTERED.

JOHN DAWSON AND CO. (NEWCASTLE-ON-TYNE), LTD., 2, Collingwood Street, Newcastle-on-Tyne.—Capital £5,000, in £1 shares. Aircraft manufacturers, engineers, &c.

Aeronautical Patents Published.

Applied for in 1916.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.

Published March 1st, 1917.

- 1,831. W. T. COULSON. Method of ascertaining when an aerial object is at a predetermined distance from a gun. (103,693.)
- 5,731. SIR W. G. ARMSTRONG, WHITWORTH AND CO. AND C. WAILE. Doors for airship sheds. (103,741.)
- 13,559. COIR TYRE CO. AND G. D. ROSE. Propellers, propeller blades, &c. (103,789.)

Published March 8th, 1917.

- 6,111. B. HINKLER. Duplicate controlling means for aeroplanes, &c. (103,918.)
- 6,804. M. DANIEL. Clutches for connecting propellers of aeroplanes with their driving shafts. (103,923.)
- 16,374. CURTISS MOTOR CO. Aerial and nautical machines. (102,261.)

Index and Title Page for Vol. VIII.

The 8-page Index for Vol. VIII of "Flight" (January to December, 1916) is now ready, and can be obtained from the Publishers, 44, St. Martin's Lane, W.C., Price 6d. per copy, post free.

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